JOURNAL OF THE ROYAL HORTICULTURAL SOCIETY

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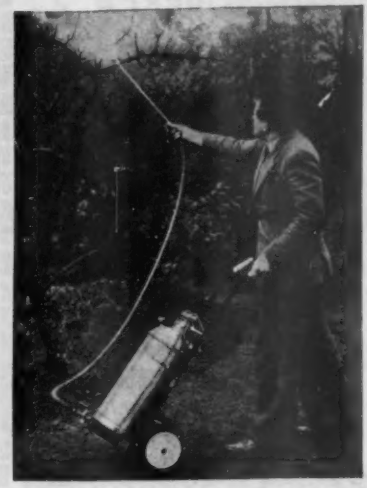

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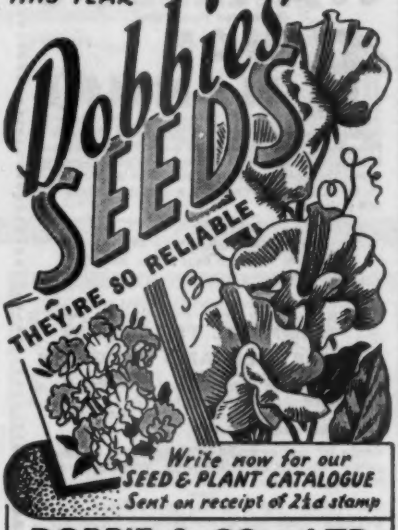

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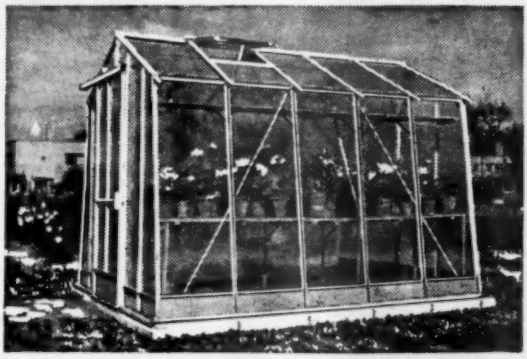

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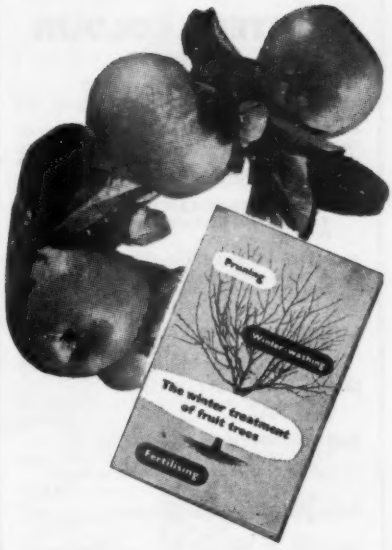

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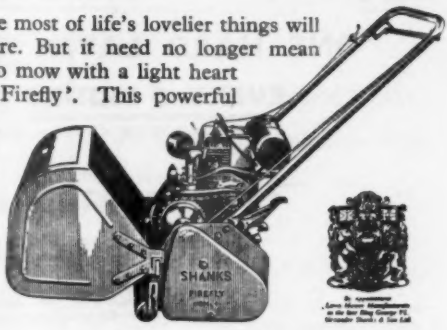

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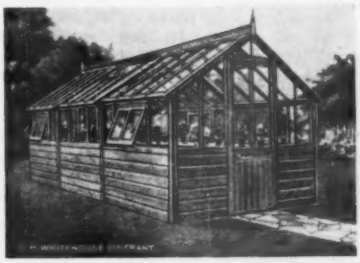

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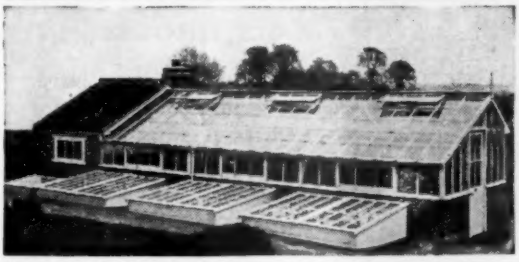

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Extracts from

THE PROCEEDINGS OF THE ROYAL HORTICULTURAL SOCIETY

GENERAL MEETINGS

July 22, 1952

JOINT ROCK GARDEN PLANT COMMITTEE—IRIS, LADY LAWRENCE, V.M.H., in the Chair, and eight other members present.

Visitors—The Chairman welcomed to the meeting Mr. Epstein, of the American Rock Garden Society.

Exhibit:

Origanum Tournefortii, from C. H. Hammer, Esq., Borcham, Essex.

August 12, 1952

SCIENTIFIC COMMITTEE: Mr. E. A. BOWLES, M.A., F.L.S., F.R.E.S., V.M.H., in the Chair, and five other members present.

Arising out of the Minutes—The Secretary read a statement from Dr. L. G. G. Warne of the University of Manchester, concerning the history of the Antirrhinums which were submitted to the Scientific Committee on July 22nd. In the autumn of 1950 two lateral shoots from near the base of the inflorescence of a plum-coloured intermediate type (varietal name not known) bore multicoloured flowers. Cuttings were taken from these two shoots and of the resulting plants six produced multicoloured flowers in 1951. From these six plants cuttings were taken and seed was saved. The cuttings flowered in April and May of this year (1952) and produced flowers of a most bizarre nature, e.g. plum-coloured with yellow spots, various shades of red with yellow spots, mainly yellow with red or plum-coloured spots and short stripes, stripes running vertically the whole length of the flower, one half of the flower a "self" and the other half spotted or striped, etc. Sometimes a single flower would be a "self" or all the flowers on one side of the spike would be "selfs."

This enormous variation even between flowers on the same plant led Dr. Warne to assume that he was dealing with a somatic mutation giving rise to a chimera. However, the seeds saved in 1951 were sown and the majority of the seedlings produced multicoloured flowers—only a few producing all selfs. The fact that these seedlings produce multicoloured flowers suggests that gene mutations are involved, but the variation between the flowers on the same plant also suggests some instability.

It appears that these plants could be the basis of a strain unlike the normal Antirrhinum though whether such a strain is horticulturally desirable was in the opinion of the Committee very doubtful.

Exhibit: Phillyrea latifolia—Professor F. E. Weiss submitted, from his garden, specimens of a plant which the Committee identified as one of the many forms of *Phillyrea latifolia* with leaves more deeply and irregularly toothed than is usual.

Early Illustration of a North American Species. Mr. W. T. Stearn put before the Committee a photograph of a coloured drawing by John White, cartographer and artist to the short-lived colony established by Sir Richard Grenville on Roanoke Island in 1585. The original drawing is in the Department of Prints and Drawings, British Museum. It portrays a pink-flowered gentianaceous plant with prominent yellow markings at the centre of the flower and agrees excellently with recently collected herbarium material of *Sabbatia stellaris* Purdh. This drawing is probably the first representation of a North American species. White's drawing of 'Wysauke' (*Asclepias tuberosa*) was crudely reproduced in Gerard's *Herbal* (1597).

Plant-Names referring to Keys—Plant-names referring to keys occur in a number of European languages but usually seem inept and far-fetched as the plants concerned bear little resemblance in any part to modern keys. Such names probably originated many centuries ago; they can only be understood by reference to old obsolete types of locks and keys. A study of such names by the Norwegian professor Rolf Nordhagen has shown that they were remarkably apt at the time when they originated. Mr. W. T. Stearn gave a summary of Nordhagen's paper "Studier over gamle plantenavn, 2: Marilykjel, springstrå og jennurt" (Bergens Museums *Årbok* 1946–7, Hist.-antikv. rekke, Nr. 3; 1948). Thus the Cowslip (*Primula veris*) is known as St. Peter's keys, Schlüsselblume, Frauenschlüssel, etc.; Nordhagen has shown that the individual Cowslip flower bears a general resemblance to an old forgotten type of key, which was used in ancient Rome; the Cowslip inflorescence resembles a bunch of such keys. The fruits, called "keys," of Ash (*Fraxinus excelsior*) and Norway Maple (*Acer platanoides*), Sycamore (*A. pseudoplatanus*) aparently recall the most primitive type of key. Nordhagen's investigation into the key-motive as illustrated by Norwegian names for

the fern *Botrychium Lunaria* has been especially fruitful of results bearing on folk-lore, the last trial for witchcraft in Norway, and the ancient construction of locks. No lock was recorded which could be opened by a key after the pattern of the Botrychium leaf. Nevertheless the existence of names such as Marinøkkel indicated the former existence of such a lock and key, and a specimen has since been found at Naustdal in Sunnfjord. Mr. Stearn called attention to the convincing illustrations in Nordhagen's paper which taught that old vernacular names for plants should not be despised and rejected because they nowadays seem unintelligible or ridiculous.

FRUIT AND VEGETABLE COMMITTEE—Mr. F. A. SECRETT, C.B.E., F.L.S., V.M.H., in the Chair, and nine other members present.

Exhibits

Peach Seedling, from E. A. Strehler, Esq., 11 Cranbourne Drive, Pinner, Middlesex
Peach Seedling, from S. W. Smith, Esq., 41 Granby Avenue, Harpenden, Herts.
Apple Seedling, from J. F. Wastie, Esq., Acre Hill, Eynsham, Oxford.
Apple Seedling, from Miss C. M. Stewart, 12 Church Street, Southport, Lancs.

FLORAL COMMITTEE A—Mr. G. W. LEAK, V.M.H., in the Chair, and seventeen other members present, with P. Collis Hallowes, Esq., of Kitale, Kenya.

Awards recommended:

Gold Medal

To Messrs. Konynenburg & Mark, Noordwyk, Holland, for an exhibit of Gladioli

Silver-gilt Flora Medal

To Messrs. W. J. Unwin, Ltd., Histon, for an exhibit of Gladioli.

Silver Flora Medal

To Mr. J. Amand, Holbeach, for an exhibit of Gladioli.
To Messrs. Kelway & Son, Ltd., Langport, for an exhibit of Gladioli.

Silver Banksian Medal

To Mr. John R. Bell, Cross-in-Hand, for an exhibit of Chrysanthemums.
To Messrs. Wakeley Bros. & Co., Ltd., North Mymms, for an exhibit of Gladioli.
To Messrs. Wheatcroft Bros., Ltd., Ruddington, for an exhibit of Roses.

Flora Medal

To Mr. H. A. Brown, South Chingford, for an exhibit of Fuchsias.
To Messrs. M. Prichard & Sons, Ltd., Christchurch, for an exhibit of herbaceous plants.
To Ruislip & District Horticultural Society, Ruislip, for an exhibit of greenhouse plants.
To Messrs. Suffolk Seed Stores, Ltd., Woodbridge, for an exhibit of herbaceous plants.

Banksian Medal

To Mr. E. B. Le Grice, North Walsham, for an exhibit of Roses.
To Mr. A. Miles, Bickley, for an exhibit of herbaceous plants.
To Messrs. Simmonds Nurseries, Ltd., Chipperfield, for an exhibit of Gladioli Zinnias and Phloxes.

To be seen again

Rose 'Cocorico,' from Messrs. Wheatcroft Bros., Ltd., Ruddington, Notts.

Other Exhibits

Cynoglossum from Messrs. Dobbie & Co., Ltd., Edinburgh.
Fuchsia from C. J. Howlett, Esq., Earley, Reading.
Petunia from A. E. Durrington, Esq., Bexley Heath.
Violas and Roses from Mr. C. A. Jardine, Feltham.
Zinnia from the Hon. V. Sackville-West, Cranbrook.

FLORAL COMMITTEE B—Lord ABERCONWAY, C.B.E., LL.D., D.Sc., V.M.H. in the Chair, and thirteen other members present.

Awards Recommended:

Flora Medal

To Messrs. Kibble & Clare, Ltd., Ascot, for an exhibit of rock garden plants.
To Messrs. L. R. Russell, Ltd., Windlesham, for an exhibit of greenhouse plants.

Banksian Medal

To Messrs. Burkwood & Skipwith, Ltd., Kingston, for an exhibit of flowering shrubs.
To Messrs. Hollybush Nurseries, Harpenden, for an exhibit of rock garden plants.
To Messrs. Robinson's Nurseries, Ltd., Eltham, for an exhibit of rock garden plants

Award of Merit

To *Buddleia Davidi* var. 'Peace,' as a hardy flowering shrub (votes unanimous), from Messrs. Winkfield Manor Nurseries, Ascot.

Other Exhibits

Agapanthus 'Blue Riband,' exhibited by Messrs. M. Prichard & Sons, Ltd., Christchurch.
Euonymus planipes, exhibited by W. Bentley, Esq., Quarry Wood, Newbury.
Gentiana asclepiadea alba, exhibited by Gilbert White, Esq., Kingston.
Haemanthus Katherinae, exhibited by J. E. Rooke, Esq., New Malden.
Collection of British Ferns, exhibited by C. J. Howlett, Esq., The Yews, Reading.
Rock garden plants, exhibited by Messrs. Old Welwyn Gardens, Welwyn.
Succulents, exhibited by Mr. C. Gilbert, Romford.
Clipped trees, exhibited by Mr. Jacques Amand, Holbeach, and Messrs. Kew Topiary Nursery, Richmond.
Heaths and other flowering shrubs, exhibited by Mr. Frederick Street, Woking.

JOINT EARLY-FLOWERING CHRYSANTHEMUM COMMITTEE—Mr. E. F. HAWES in the Chair, and nine other members present.

Awards Recommended:

First Class Certificate

To Chrysanthemum 'Brighton Yellow,' as a variety for exhibition (votes 8 for, 0 against), shown by W. Avery, Esq., 11 Chrisdory Road, Portslade-by-Sea, Sussex.

Award of Merit

To Chrysanthemums (ss varieties for exhibition) 'Derby Cream' (votes 6 for, 1 against), 'Elizabeth Anne' (votes 9 for, 0 against), 'Red Tibshelf Ideal' (votes 7 for, 0 against), 'White Hope Valley' (votes 8 for, 0 against), 'Incurved Hope Valley' (votes 8 for, 0 against), 'Tibshelf Belle' (votes 8 for, 0 against), all shown by Messrs. J. & T. Johnson, The Nurseries, Tibshelf, Derbyshire.

Selected for Trial at Wisley

Chrysanthemum 'Orange Lad,' from Messrs. J. & T. Johnson, The Nurseries, Tibshelf, Derbyshire.

To be seen again

Chrysanthemum 'Buff Sweetheart,' from Messrs. R. & J. Turner, Ltd., Quay Road Nurseries, Bridlington.
Chrysanthemum 'Betty Axtell,' from J. Axtell, Esq., 32 Nelson Road, Stanmore, Middlesex.

Other Exhibits

Chrysanthemums from Messrs. J. & T. Johnson and J. Axtell, Esq.

JOINT DAHLIA COMMITTEE—In the absence of the Chairman and Vice-Chairman, Mr. G. W. LEAK, V.M.H., took the Chair. Four members, six others being co-opted from Floral Committee A, and Mr. P. Collis Hallows from Kenya, were present.

Selected for Trial at Wisley

Dahlia 'Vanguard' and 'Miriam,' both shown by F. C. Tattersall, Esq., 33 Howard Road, Bournemouth.
Dahlia Seedling No. 45, shown by Mr. J. F. Barwise, Towneley, near Burnley.
Dahlia 'Artica,' shown by A. T. Barnes, Esq., Kingsbrook Gardens, Cardington Road, Bedford.
Dahlia 'Mary Richards,' shown by A. E. Drewett, Esq., 3 Newnham Avenue, Bedford.

Other Exhibits

Dahlia Seedlings, shown by Mr. J. F. Barwise, Towneley, near Burnley.
Dahlia Seedling, shown by A. E. Drewett, Esq., 3 Newnham Avenue, Bedford.

AWARDS TO SUNDRIES, APRIL—JUNE, 1950

Highly Commended

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Plastic Flower Pots from Moulded Plastics Ltd., Walthamstow Avenue, London, E. 4.

AUGUST 26, 1952

SCIENTIFIC COMMITTEE—Mr. E. A. Bowles, M.A., F.L.S., F.R.E.S., V.M.H., in the Chair, and three other members present.

Virescent Delphinium.—Mr. W. P. Wood, South Stoke Vicarage, nr. Reading, Berks, showed an example of virescence on an eight-year-old Delphinium originally raised from seed. Its normal height is 6–7 feet, but the virescent plants are only 3 feet tall. The flowers showed marked phyllody, the various organs of the flower assuming the character of foliage leaves.

Proliferating Maize.—Mrs. F. Perry, Hardy Plant Farm, Enfield, Middlesex, exhibited a specimen of the fructification of the Maize showing proliferation of the axis.

Tripterygium Wilfordii.—A specimen in magnificent fruit and under the name of *Tripterygium Forrestii* received the Award of Merit from Floral Committee B, when shown by Col. F. C. Stern, V.M.H., Highdown, Goring-on-sea, Sussex. The plant was referred to the Scientific Committee for confirmation of name. The Committee confirmed that *T. Forrestii* was synonymous with *T. Wilfordii* which is figured and discussed in the *Botanical Magazine* (t. 9488).

FRUIT AND VEGETABLE COMMITTEE—Mr. F. A. Secrett, C.B.E., F.L.S. V.M.H., in the Chair, and twelve other members present.

Awards Recommended:

Award of Merit

To Peach 'Granny,' from E. A. Strehler, Esq., 11 Cranbourne Drive, Pinner, Middlesex, as an outdoor variety ripening during the latter half of August (votes 7 for, 3 against).

To Peach 'Bushwood Beauty,' from Mrs. M. Tuckey, 34 Bushwood Road, Kew, Surrey, as an outdoor variety ripening during the latter half of August (votes 6 for, 3 against).

To Plum 'Laxton's Goldfinch,' from The Director, The National Fruit Trials, Wisley, as a large-fruited Gage ripening at the end of August (votes unanimous). This variety was raised by Messrs. Laxton Bros. Bedford, Ltd.

Selected for Observation at Wisley

Plum 'Reine Claude Berger,' from M. Nicholls, Esq., Owlswood, 34 Mill Lane, Sevenoaks, Kent.

Other Exhibits

Exhibit of Plums, from The Director, The National Fruit Trials, Wisley.

Apple Seedling, from Rev. Conway Davies, M.A., Bradwell Vicarage, Wolverton, Bucks.

Apple Seedling, from A. A. Hickman, Esq., 416 Mutton Lane, Potters Bar, Middlesex.

Apple Seedling, from G. W. Kerlogue, Esq., 21 Cambridge Road, Southend-on-Sea.

Apple for naming, from H. B. G. Montgomery, Esq., Snells Farm, Amersham Common, Bucks.

Melon Seedling, from Mrs. C. W. Denham, Queenwood, Ottershaw, Surrey.

FLORAL COMMITTEE A—Mr. J. L. Russell, in the Chair, and ten other members present.

Awards Recommended:

Silver-gilt Banksian Medal

To Messrs. Kelway & Son, Ltd., Langport, for an exhibit of Gladioli.

Silver Banksian Medal

To Messrs. Yelland Nursery, Teignmouth, for an exhibit of Chrysanthemums.

Flora Medal

To Mr. A. Miles, Bickley, for an exhibit of herbaceous plants.

Banksian Medal

To Messrs. M. Prichard & Sons, Ltd., Christchurch, for an exhibit of herbaceous plants.

To Messrs. Wheatcroft Bros., Ltd., Ruddington, for an exhibit of Roses.

Award of Merit

To Rose 'Cocorico' (votes 9 for, 0 against), from Messrs. Wheatcroft Bros., Ltd., Ruddington.

Selected for trial at Wisley

Chrysanthemum maximum 'Thomas Killin,' from J. C. Whittet, Esq., Kilmacolm, Renfrewshire.

Some publications of

The Royal Horticultural Society

suitable for Christmas Gifts

THE JOURNEYS AND PLANT INTRODUCTIONS OF GEORGE FORREST, V.M.H.

Edited by Dr. J. Macqueen Cowan, C.B.E.
with the assistance of members of the staff of the Royal Botanic Garden, Edinburgh, and E. H. M. Cox

To George Forrest and his collectors we owe a very large number of the fine plants introduced from Western China, Upper Burma and Eastern Tibet, which have made so great an addition to our gardens in this century. Forrest travelled and lived in China almost continuously from 1904 to 1931 and had many adventures, particularly on his early journeys. It is fitting that we should pay tribute to him in this book, produced under the editorship of Dr. Cowan of the Edinburgh Botanic Garden. This book contains a personal account of the collector by Sir William Wright Smith, F.R.S., Regius Keeper of the Edinburgh Botanic Garden; an account of his journeys by E. H. M. Cox, who himself travelled with Farrer; chapters on Rhododendron and Primulas by Dr. Cowan and Dr. H. R. Fletcher respectively, and shorter sections on all the other main genera in which Forrest collected notable plants. It should be interesting to all keen gardeners to read of the conditions under which many of their plants grow in the wild. There are 85 monochrome illustrations, many of great beauty and printed in gravure with great care, and these include many photographs taken by Forrest himself of the plants in their natural habitats. There are also five colour plates showing some of his most outstanding introductions which include such plants as *Gentiana sino-ornata, Rhododendron Griersonianum, Primula malacoides* and *Pieris Forrestii*.

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1953
R.H.S.
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Keeper of the Herbarium, Royal Botanic Gardens, Kew

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LILY

This book includes an important new list of hybrid Lilies raised in this country and introduced since 1939. Colonel F. C. Stern contributes two articles, one on some of his new aurelianense hybrid Lilies and the other on Notholirions in the Garden, and Mr. H. F. Comber has written a long article on Lilies introduced since 1900. Mr. E. S. Hyslop describes his experience with Lilies in his Suburban Garden, and Mr. T. James writes on Lilies in a London garden. Monsieur E. Debras writes on Lilies in France during 1951 and 1952, and other overseas contributors include Mr. Jane de Graaff on Lilies at the Oregon Bulb Farm, and Mr. G. O. Payne on his experiences with raising Lilies from seed in New Zealand. There is also an article on Fritillarias by Mr. Norman Hadden. Reports of the Lily Show and the Discussions held by the Lily Group during the year are included.

RHODODENDRON

The late Mr. Lionel de Rothschild before he died had made notes on many of the Rhododendrons at Exbury, and this volume includes the first part of these notes together with a preface by Mrs. M. L. de Rothschild. Dr. J. Macqueen Cowan writes on Rhododendrons at the Edinburgh Garden, Mr. E. H. M. Cox on Rhododendrons in the East of Scotland, and Mr. P. M. Synge on Rhododendrons at Muncaster Castle in Cumberland. Overseas Rhododendron growing is represented by articles from Mr. J. S. Wells of New Jersey, U.S.A., who writes on the propagation of Rhododendrons from stem cuttings, while also from America are articles on the trial garden of the American Rhododendron Society by Mr. J. G. Bacher and the Tacoma Rhododendron Show by Mr. L. F. Frisbie. Mr. J. S. Yeates of New Zealand contributes an article on the tip-grafting of Rhododendrons, Azaleas and other plants. Reports of the Show, Trials and Awards are also included.

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oyal Horticultural Society and these include many important nomenclature, discovery, breeding and cultivation of par- tific work is now published in these Year Books, which are reference for growers as well as for scientific workers. Their h they may have been published, and it is for this reason that ution should subscribe annually to these books. Owing to the to reduce the size of each book from Royal 8vo to Med. 8vo.

FRUIT

This volume contains a special section on fruit growing overseas. Mr. Thomas Neame describes his world tour of fruit research stations, Count Knuth writes on his recent visit to the South American fruit growing areas, Dr. Herrero describes fruit growing in Spain and there is an article on fruit in Jamaica by Mr. Raymond Bush in which among other fruits he deals with banana growing and illustrates his remarks with some unusually beautiful photographs. A new method of training old Apple trees by "festooning" is described by Major Hog. There are also articles on Blueberries, new methods of training Raspberries, Grape growing out-of-doors and many other aspects of fruit growing including reports of the discussions held by the Fruit Group.

DAFFODIL AND TULIP

Many aspects of Daffodil cultivation both at home and overseas are included in this volume. Mr. Blanchard writes on the various forms of *Narcissus Bulbocodium* and Mr. N. F. Lock writes on some of his experiences with Daffodils. Major C. B. Habershon suggests some good cheap show Daffodils while Mr. Guy L. Wilson and Mr. H. J. Randall write on the Daffodil Season. Overseas contributors include Mr. F. Reinelt on Daffodil Breeding in Washington and Oregon and Mr. Grant E. Mitsch on Daffodils in Oregon, and Mrs. H. K. Link on the Daffodil Season in Indiana. Reports of Daffodil shows both at home and abroad are also included. Mr. W. Austin contributes an article on Tulips for bedding.

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JOURNAL OF THE ROYAL HORTICULTURAL SOCIETY

Vol. LXXVII Part 11

November 1952

THE SECRETARY'S PAGE

ANNOUNCEMENTS—NOVEMBER AND DECEMBER

Shows

TUESDAY, November 4 12 NOON to 6 P.M. WEDNESDAY, November 5 10 A.M. to 5 P.M.	Fortnightly Show. Floral Arrangement Competition for Amateurs. British National Carnation Society's Competition.
TUESDAY, November 18 12 NOON to 6 P.M. WEDNESDAY, November 19 10 A.M. to 5 P.M.	Fortnightly Show.
TUESDAY, December 2 12 NOON to 6 P.M. WEDNESDAY, December 3 10 A.M. to 5 P.M.	Fortnightly Show. Late Apple and Pear Competition.

Lectures

TUESDAY, November 4, at 3 P.M. Masters Memorial Lecture, "Cytology and Horticulture," Part II, by COL. F. C. STERN, O.B.E., M.C., F.L.S., V.M.H.

TUESDAY, December 2, at 3 P.M. "The Contribution of Soil to Plant Environment," by MR. B. S. FURNEAUX, M.SC., F.G.S.

Demonstration at Wisley—The following demonstration will be given at Wisley, that on the second day being a repetition of that given on the first.

Fruit Garden

November 26-27. The Pruning of Fruit Trees. (Commencing at 11 A.M.)

The Society's Examinations in 1953.—Candidates who wish to

enter for the Society's Examinations in Horticulture in 1953 are reminded that the closing dates for entry forms are as follows :—

General Examination in Horticulture, and General Examination in Horticulture for Juniors—Monday, January 12, 1953.

National Diploma in Horticulture—Intermediate and Final, and N.D.H. Honours, February 1, 1953.

Teachers' Diploma in School Gardening—Intermediate and Final Examinations, February 1, 1953.

WISLEY IN NOVEMBER

IT is unlikely that there will be many flowers remaining in the open this month, for the last of the Chrysanthemums and Dahlias will have succumbed to the weather; but many trees and shrubs will still be carrying coloured foliage or crops of berries, some only now reaching their best.

Even in this traditionally gloomy month there are usually several brilliant sunny days, on any of which the visitor may be surprised by the variety and richness of colouring, especially in the more open parts of the Gardens such as Seven Acres and the Pinetum. In less favourable weather an hour or two can be spent profitably in the greenhouses, where in addition to familiar and well-tried plants there are many uncommon species. Those who can endure tropical heat and humidity will be well repaid for a visit to the Stove and Orchid House. Many beautiful foliage plants are to be seen here, among the most striking being *Anthurium* × *Pfitzeri* with deep green, crinkled leaves a yard long, and one of its parents, *A. crystallinum*, with silver veins intersecting its dark velvety leaf-surfaces. *Alocasia indica* var. *violacea* has sombre-hued leaves veined with blue on long slate-grey petioles, and *Dracaena terminalis* narrower, beetroot-red foliage. Among the Codiaeums, Caladiums and Coleus hardly two plants are quite alike in the size and mottling of their leaves with many shades of yellow, rose and purple.

Some of the flowering plants which contribute to the gaiety of the scene are *Euphorbia fulgens* with long leafy wands of vivid vermilion flower-heads, *Columnea gloriosa* trailing from its hanging baskets long sprays studded with large orange-scarlet blooms, and *Plumbago rosea*, a most valuable Winter-flowering plant which has flowers of an unusual light scarlet tint. The orange blossoms of *Gesneria chromatella*, the violet of *Saintpaulia ionantha* and the varied pinks of *Begonia semperflorens* continuing for many weeks make these plants especially valuable.

In the Orchid collection the varieties and species of Cypripedium will be coming into flower together with some others such as *Zygopetalum Mackaii*, a reliable plant which rarely fails to produce spikes of fragrant green and purple blooms, *Coelogyne Mooreana* with white tepals and golden-hairy labellum, and *C. fuliginosa* with flowers of rose-tinted buff.

There is always something of interest and beauty in the Temperate

House, and November should see several species of Acacia opening their flowers. There are large specimens of *A. Baileyana*, perhaps one of the most beautiful, with finely-dissected grey leaves and canary-yellow plumes of blossom, *A. dealbata* of similar colouring but larger in all its parts, *A. Riceana* with dark awl-shaped phyllodes and fluffy heads of pale yellow, and *A. longifolia* which has much larger flattened phyllodes and sprays of golden blossom. *Camellia Sasanqua* var. *fragrans*, which bears large saucer-shaped rose-flushed flowers, is the first of its kind to come out, and this year buds were beginning to open in the first half of September. By now it will be joined by the earlier varieties of *C. japonica* which develop to perfection under glass. *Jasminum polyanthum*, a prolific Chinese species, is too tender to be planted outside at Wisley, but here its white flowers fill the house with pleasant perfume. Among the plants which are rarely without a flower are the climbing *Hibbertia volubilis*, an Australian evergreen with conspicuous golden petals; *Strelitzia Reginae*, the well-known Bird of Paradise flower; *Cestrum aurantiacum*, often displaying its abundant orange flowers and white berries at the same time, and *Rhododendron mucronatum*, typically white although occasionally opening a chimerically purple-splashed bloom.

In the centre bed there is a plant of *Cyphomandra betacea*, the Tree Tomato, a fast-growing Brazilian species which in its second year yields a crop of edible egg-shaped purple fruits with a flavour somewhat like that of the Tomato. Here, too, is *Moschosma riparium*, a shrubby Labiate of rank growth but of graceful aspect when carrying its great panicles of minute lilac-tinted dioecious flowers.

Of the many foliage plants which furnish an unobtrusive but necessary setting for their more conspicuous neighbours the two elegant specimens of *Cupressus cashmeriana* standing at the North end of this house and *Platycerium alcicorne*, the epiphytic Elk's-horn Fern, hanging between them, should be noted; and a pretty patchwork is formed beneath the benches by varieties of *Begonia Rex* mingled with the silver-striped *Zebrina pendula* and *Oplismenus imbecilis*.

Opposite the North end of the Temperate House the visitor will see a large bush of *Poncirus trifoliata*, the Prickly Orange, bedecked with bright but astringent fruits and a fine specimen of *Parrotia persica* resplendent in its Autumn garb of crimson, bronze and yellow. The Azalea garden, a short distance away, is still brightened by the fading leaves of Azaleas and Viburnums, a tall Tulip-tree clad in clear yellow, and *Cornus florida rubra* with curled plum-purple leaves. In the Award of Garden Merit collection some early blossoms may be visible among the bronze foliage of *Viburnum fragrans*; and some other good things here are the large old tree of *Rhus Cotinus* which annually gives a fiery display for a short period, *Acer griseum*, decorative at all seasons, and *Crataegus Lavallei*, a shapely Thorn white-flowered in May and now bearing plentiful orange berries.

Passing into the open space of Seven Acres it will be observed that the brightness of the Heath Garden has almost faded, but the rust-brown heads of *Erica vagans* and *E. terminalis* are still attractive in sunshine. Some of the late-ripening Cotoneasters like *C. serotina*

and *C. lactea* are becoming more conspicuous, and *Stranvaesia Davidiana* with pendent bunches of crimson berries and some of the older leaves similarly coloured is particularly handsome. In mild spells of weather the first flowers open on the leafless branchlets of *Prunus subhirtella autumnalis*, but a more liberal display is to be expected in early Spring.

Perhaps the most pleasing autumnal colouring is to be found in the Wild Garden where the bright hues of the deciduous North American Vacciniums, including *V. virgatum*, *V. pennsylvanicum* and *V. corymbosum*, together with the related *Pieris mariana*, *Fothergilla monticola* and a stately tree of *Oxydendrum arboreum* contrast effectively with the varied greens of the Rhododendrons.

On Battleston Hill, too, many very delightful examples of colouring are to be enjoyed, although this area has been planted mainly with a view to its Spring display of flowers. Here, for instance, one may see slender young Eucalyptus trees of pale silvery-green associated with the more intensely hued species of Abies and backed by Oaks and Chestnuts in their tawny autumnal foliage.

Little is to be expected of the Rock Garden and Alpine House so late in the season. There are, however, flowers on *Gentiana sino-ornata*, *Saxifraga Fortunei* and *Schizostylis coccinea*, and belated blooms linger on some Geraniums and Polygonums.

GARDENS WITHOUT FLOWERS

Lord Aberconway, C.B.E., LL.D., D.Sc., V.M.H.

As one who greatly appreciates the presence of brilliant flowers in a garden, I rather hesitate to write in praise of gardens which have no flowers, but there are times of the year when gardens, however lavishly planted with flowering plants, have nothing that is blooming.

A garden, say, of Rhododendrons when the flowers are over, and when the growth is being completed, can be a lovely sight. The different tones of green, the different shapes of the plants, and the different shapes of the leaves, have a way of combining together in a wonderful arrangement, and one can walk along by the plantings and get, at any rate, some of the pleasure that the garden gave earlier in the year when the plants were in flower.

A formal garden, too, laid out, say, in terraces can be very satisfactory, when the flower borders are over and the plants are left only with their browns and greens.

Autumn colours belong perhaps more to the woods than to the garden, but they mingle as a background with the greens of the garden without flowers.

The famous woodland garden at Westonbirt was considered to be at its very best towards the end of October. Planted with the greatest taste, it was a wonderful show of colours of all shades. At the same season Sheffield Park was a magnificent blaze of colour.

There are many other gardens in this and other countries which did not rely, or only relied to a very small extent, on actual flowers.

The great garden avenues of Beech at Bramham and at Hackwood are superb with their tall, shining stems, planted perhaps 150 or 200 years ago.

I motored through Derbyshire the other day, and saw an invitation extended to the public to see Chatsworth.

The house was hospitably shown in all its beauty to the hundreds of visitors who thronged through it, but what struck me most were the views of the garden. There were a few flowers which hardly counted one way or another, but the great beauty was the magnificent planting of great forest trees on lawns, diversified by great stretches of water, with fountains, cascades and pools. One could have stood at the windows for a long period and observed the beauty of the arrangement with nothing misplaced, nothing jarring, and nothing which should not be there.

There must be other gardens in England like these that one does not know.

There are, of course, great gardens in other European countries.

Versailles had few flowers, but the garden seems perhaps too vast without a great Court to fill them, and the trees perhaps too small.

Vaux le Viscomte is, I think, better than Versailles, but beautiful as it is, and fine as is its design, it just misses the intimate attractions that a garden should have.

The Spanish gardens have flowers and architecture, and above all, Cypresses and fountains, but they do not reach quite the level of the famous Italian gardens of the early ages.

SIR GEORGE SITWELL's book on Italian gardens emphasizes the beauty of a garden which is quiet and restful, and the Italian gardens of the Renaissance depended on this quality and on the murmur of the fall of fountains and of water courses. After all, the Italian garden, to be enjoyed as it would be in the summer in a very sunny climate, would of necessity be a garden of shelter, shade and water. There is no more noble tree, nor any tree that one can envy more in Europe than the giant Italian Cypress, especially when, as has been the case in Italy, it is planted by the hand of an artist.

In Italy, from the great Villa d'Este down to other gardens, perhaps of lesser importance, with but a wealth of Cypress, architecture and water, there are some most wonderful effects, and practically all of them are gardens without flowers.

We must not despise gardens without flowers. Among them are fine gardens, yet, while I admire many of them intensely, as I do, I still prefer the gardens that we have in England—gardens which have flowers.

MASTERS MEMORIAL LECTURES, 1952

CYTOLOGY AND HORTICULTURE

F. C. Stern, O.B.E., M.C., F.L.S., V.M.H.

PART I

(*Lecture given on October* 21, 1952. LORD ABERCONWAY, C.B.E., LL.D., D.SC., V.M.H., *in the Chair*)

TWO years ago Mr. M. B. Crane, the well-known geneticist and plant breeder, gave the Masters Memorial Lectures when he spoke of the Origin and Improvement of Cultivated Plants.

In these two lectures which the Council of the R.H.S. has asked me to give I shall endeavour to show the value of the sciences of genetics and cytology to the gardener and the plant breeder, amateur or professional.

Genetics is the science of heredity and variation, and Cytology is the science of the cell and all that it contains. These two sciences are both comparatively new and started for all practical purposes about fifty or sixty years ago. At first they were considered separate disciplines or branches, but now they have been shown to be so closely connected that neither discipline can get on without the other; they are now considered as one science. Cytology shows the physical basis of how heredity and variation take place.

The R.H.S. is particularly concerned with Genetics, as the name of this new science was actually coined in the Lecture Room of the R.H.S. on July 31, 1906, by PROFESSOR W. BATESON. The story of the birth of genetics was given by MRS. RONA HURST in the September R.H.S. JOURNAL, 1949, and is worth repeating as it is so intimately connected with the R.H.S. and with DR. MAXWELL MASTERS in whose memory these lectures are given. DR. MASTERS, who was editor of *The Gardeners' Chronicle* for forty-two years, from 1865 to 1907, was for many years Chairman of the Scientific Committee of the R.H.S. In 1898 the Royal Society formed an Evolution Committee and invited the R.H.S. to send delegates to it. DR. MASTERS and the Secretary at that time, the REV. W. WILKS, were enthusiastic about the idea. It was as a result of this collaboration that in 1899 the first Conference on "Hybridization" was called by the Council of the R.H.S.

Then in 1900 PROFESSOR BATESON was asked to lecture again to the R.H.S., and a dramatic event occurred. The morning he was leaving Cambridge for London, on May 8, he received a letter from PROFESSOR DE VRIES, from Holland, enclosing a paper entitled "Experiments in Plant-hybridization" by GREGOR MENDEL, the Abbot of Brunn. This paper had been written in 1865 and published in the local Natural History Society's journal. It was simultaneously discovered by DE VRIES in Holland and two other German scientists. MRS. BATESON has graphically described how BATESON read this paper in the train going up to give his lecture at the R.H.S. He at once saw the immense importance of this paper and the experiments it described, so he decided to change

his lecture and deal with the subject of MENDEL's paper. Therefore the Fellows of the R.H.S. were the first people in England to hear of MENDEL's epoch-making discoveries. MENDEL's paper was translated and published in the R.H.S. JOURNAL in the first part of Volume 26 in 1901. So DR. MASTERS and the R.H.S. were intimately connected with the birth of the science of Genetics.

This paper, written by a monk in an Augustinian monastery at Brunn, described the experiments he had carried out during a period of eight years, in the hybridizing of Peas and other plants. This was a milestone in biological science and one of the foundations of the science of Genetics.

MENDEL proved certain laws in heredity which have been confirmed many times over in the fifty years since his paper was rediscovered in 1900. He carried out experiments in crossing Peas with different characters; hybridization experiments had often been carried out before but MENDEL's experiments were carefully thought out and simplified by taking one character at a time, such as flower-colour or tallness and dwarfness. In each experiment the most exact statistics were kept and the resulting progeny carefully counted. He proved that in crossing two pure lines of Peas which differed in height, all the first hybrid generation (F_1) were tall. He then selfed these hybrids and the result was that the next generation (F_2) resolved itself into tall Peas and dwarf Peas, and over a large number of experiments the ratio always came the same, $\frac{3}{4}$ tall Peas and $\frac{1}{4}$ dwarf Peas. He further found that in the next generation (F_3) $\frac{1}{4}$ of the $\frac{3}{4}$ tall Peas bred true and the $\frac{1}{4}$ dwarf Peas always bred true, but that the two other quarters tall Peas again broke up into the ratio of 3 tall to 1 dwarf. MENDEL named the character which was transmitted entirely or almost unchanged in the first generation the "dominant" character, and the latent character "recessive."

His next experiment was to take more than one character into account, crossing a Pea with round and yellow seed with a Pea having wrinkled and green seed. The result was that in the first generation (F_1) all the hybrids had round and yellow seed which were the dominant characters, and in the next generation (F_2) when selfed, the progeny segregated into the ratio of $\frac{9}{16}$ round and yellow, $\frac{3}{16}$ round and green, $\frac{3}{16}$ wrinkled and yellow, and $\frac{1}{16}$ wrinkled and green, that is, a ratio of 9:3:3:1

The importance of these experiments and in breeding generally was firstly that though a plant might look exactly the same as another plant in its outward appearance, which is known as its "phenotype," there is contained within it the recessive or latent characters inherited from its ancestors (not necessarily from its parents) which might appear in future generations; its heredity, expressed or unexpressed, is known as its "genotype"; and secondly, that in inheritance there are statistical laws which over a number of crossings will always come true. MENDEL's paper written over eighty years ago has a very modern outlook. Among many other points he drew attention to "hybrid vigour" when different pure lines were crossed. This phenomenon has only in late years been taken advantage of commercially. It has completely revolutionized the growing of Maize in the United States. MR. CRANE in his lecture two years

ago gave the figures of the average yield of Maize per acre in the U.S.A. up to 1939 as 25 bushels an acre, whereas in 1948 it was 42·7 bushels per acre due to the crossing of pure lines of Maize. The same thing has happened with the breeding of Poplar trees in Sweden where they have crossed the European Poplar *Populus tremula* and the North American Poplar *P. tremuloides* and produced a much more vigorous tree. I will come to the reasons for this later.

MENDEL's proof that the outward appearance of a plant, the "phenotype," contained the unseen properties of its ancestors in the "genotype," was of the greatest importance. MENDEL also carried out experiments in fertilization and proved that one pollen grain was sufficient to fertilize one seed.

We come now to the mechanical process of how the outward and visible characters occur. It has been discovered that in the cells of which all plants and animals are composed, there is a nucleus, and in that nucleus are the chromosomes carrying the genes which hold the properties or determinants of inheritance. The nucleus with its chromosomes behaves in two different ways, firstly when the plant is growing and secondly when the plant is producing its pollen and its ovules for fertilization. The first phenomenon is known as mitosis and the second as meiosis.

In the growth of an organism the cells divide, but before the cells divide, the nucleus in the cell "unwinds" and the chromosomes contained in the nucleus become visible under the microscope. A spindle formation appears in the cell and the chromosomes form themselves into a single plane across the middle of the spindle. Then each chromosome splits in two, and half of each chromosome in a normal plant moves to the poles at each end of the spindle. The spindle then contracts in the middle and breaks in two, thus two new cells are formed, each with a nucleus with exactly the same number of chromosomes as the nucleus of the original cell. This is the mitosis of the growing plant.

Meiosis is the name given to the formation of the germ cells in the sexual organs, that is, in the pollen grains and in the ovules, when each pollen mother cell and each embryo-sac mother cell divides to produce four cells each with the haploid or half the number of chromosomes. If the pollen grains and ovules contained the same number of chromosomes as the other cells of the plant, the seedlings would have double the number of chromosomes of their parents. Nature has evolved a very wonderful and intricate arrangement for the chromosomes of the cells of the sexual organs to be reduced to half the number of the normal cells of the plants. It is largely due to the work of DR. C. D. DARLINGTON, F.R.S., Director of the John Innes Horticultural Institution that this intricate arrangement has been clarified.

As meiosis approaches, the chromosomes of the sexual cells appear as long single threads; chromosomes of each parent in these cells are attracted to each other and pair together; then during this pairing there is a re-combination of parts of the chromosomes contributed by each of the parents. These then split apart and in doing so, the chromatids, as they are called, break in one or more places so that new chromatids are formed consisting of segments of each parent chromosome. This is one

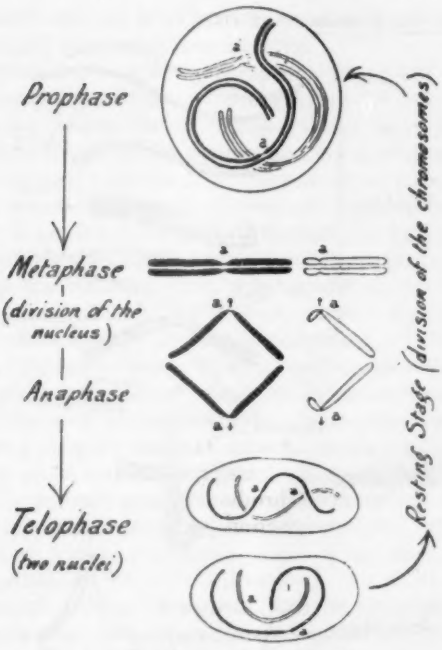

DIAGRAM OF MITOSIS

Diagram showing the changes undergone by two chromosomes in the course of mitosis.

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of the most important phenomena in all heredity. A chiasma or cross-like structure is formed in this way and the two chromosomes separate to the opposite poles of the spindle. A second cell division then occurs in which each chromosome separates into its two single chromatids, each group of which becomes a nucleus of the germ cell of the anther, i.e. pollen grain, or ovule, i.e. the egg, and in each case forming four germ cells.

The importance of this wonderful arrangement is two-fold; in the first place the four germ cells are produced with only one division of the chromosomes so that the chromosome number in each cell is halved, and in the second place the four germ cells do not contain the same type of chromosome as either parent but a recombination of each, a combination containing part of each of the parent chromosomes, a mixture which happens entirely at random.

This is the mechanism which explains MENDEL's first law that any individual which receives from its parents two identical factors will breed true, but if the factors are different, tallness and dwarfness for instance, they will separate (or segregate) in the next generation; and also it

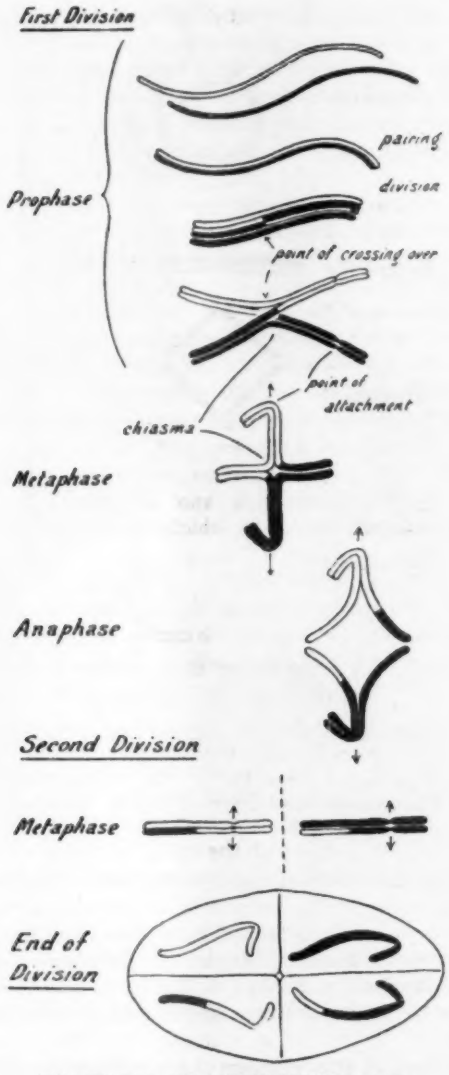


DIAGRAM OF REDUCTION OF CHROMOSOMES IN GERM-CELL FORMATION

Crossing-over occurs at the moment the chromosomes divide into two threads, and the point of the crossing-over becomes the chiasma when the chromosomes fall apart at the fourth stage of prophase. The "point of attachment" is the spindle attachment at the primary constriction.

Reproduced from Dr. C. D. Darlington's *Chromosomes and Plant Breeding*, by kind permission of the author.

explains MENDEL's second law that different factors re-combine at random in the second generation from a cross.

Every seedling from a true breeding race may differ somewhat from each other if every factor inherited from its ancestors is not exactly the same; just as in a human family all the children have a family likeness but each child differs from the others in some characters.

The cells of every diploid plant contain chromosomes of different kinds, each of which is represented twice, one derived from the egg cell and the other from the pollen. In a diploid the basic number is the number of chromosomes divided by two. A tetraploid plant is one that has four times the basic number, a hexaploid one that has six times the basic number, and so on. Those plants with a greater number of chromosomes than double are called polyploids. It does happen in nature and in cultivation that a diploid plant crosses with a tetraploid, and a triploid plant is formed; that is, it has three times the basic number. Such plants in the wild die out unless they have some mechanism which allows them to propagate themselves vegetatively; for instance, *Lilium tigrinum* is a triploid and does not seed; it forms bulbils on the stem which fall to the ground and grow; another instance is *Tulipa saxatilis*, also a triploid found wild in Crete, which never seeds but forms runners underground which make new bulbs, and so it has survived. There are many other instances.

To be successful in the breeding of plants it will save much time and it really becomes essential to know the chromosome history of the plants one is working with. This knowledge will reveal possibilities to the plant breeder and what likelihood he will have of obtaining variation or even successful crosses.

It is necessary to discover in the plants one is working with whether the species of a genus all have the same basic chromosome number, like the Roses with a basic number of 7, or whether the species have different basic numbers, like Crocus which have basic numbers ranging from 3 up to 15 or higher. The species with the same basic number are more likely to cross together than those whose species have different basic chromosome numbers.

Some genera, like Primula, have different basic numbers in the different sections of the genus. So the species in each section are more likely to cross with each other than if the breeder tries to cross species of two different sections which have different basic chromosome numbers. The next thing to discover is whether among those genera which have the same basic number, all the species are diploid with an occasional triploid, as in Lilies, or whether the genus contains diploids and tetraploids, as in Paeonies, or whether there are species in the genus which are diploids, tetraploids and greater polyploids, as in Primula and Buddleia.

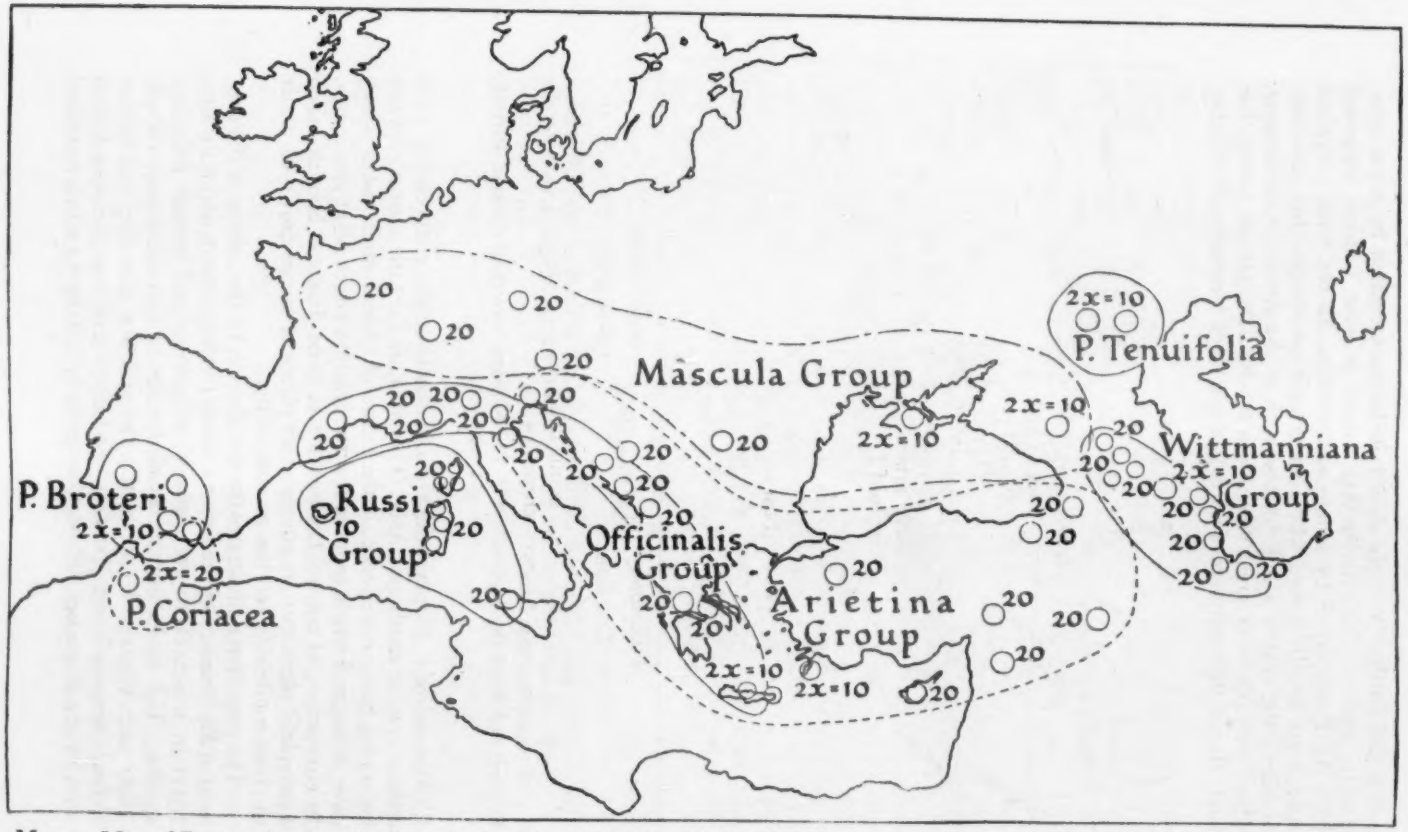
The clearest way to show the chromosome picture of the wild plants of a genus or sub-genus is by making geographical maps which show at a glance whether the species all have the same chromosome numbers, whether there is polyploidy in the genus, and also the climates favoured by the different species. Naturally one has to discover the chromosome numbers before one can make a map. A number of such

maps have been made; one of the first was made by PROFESSOR IRENE MANTON (1937) showing the distribution of the diploid and tetraploid forms of *Biscutella laevigata;* others have been made by R. S. MOORE (1947) for Buddleia, and by DR. JANAKI AMMAL (1950), lately Cytologist at Wisley, for Magnolias, Rhododendrons, Philadelphus and Camellias, and by DR. FERNANDES (1951) for Daffodils. These maps show the plant breeder what has taken place among the wild plants, and so give him hints of what courses are open to him; further, they may show how the evolution of the species of the genus has taken place.

It is not necessary to show a map of the different species of Lilies as all the wild species are found in the Northern Hemisphere, and they are all diploid, with one exception, with a basic number of 12. There is one triploid, as I mentioned before, *L. tigrinum* with 36 chromosomes, which has been in cultivation in China since time immemorial. The bulbs are said to be used as food in China and are therefore no doubt cultivated largely. To obtain new types of Lilies, successful results are more likely to be obtained by crossing different species than by trying to create polyploid Lilies. If polyploidy had been an advantage to the genus, it would probably have arisen among the wild species at some time in its long history. Polyploid Lilies have been created by chemical means by breeders both here and in America but they are not much improvement on the wild species. One of the finest Lilies is the hybrid *L.* × *testaceum*, a cross between two species. Crosses between species or hybrids will probably be the best way to produce fine new hybrid Lilies.

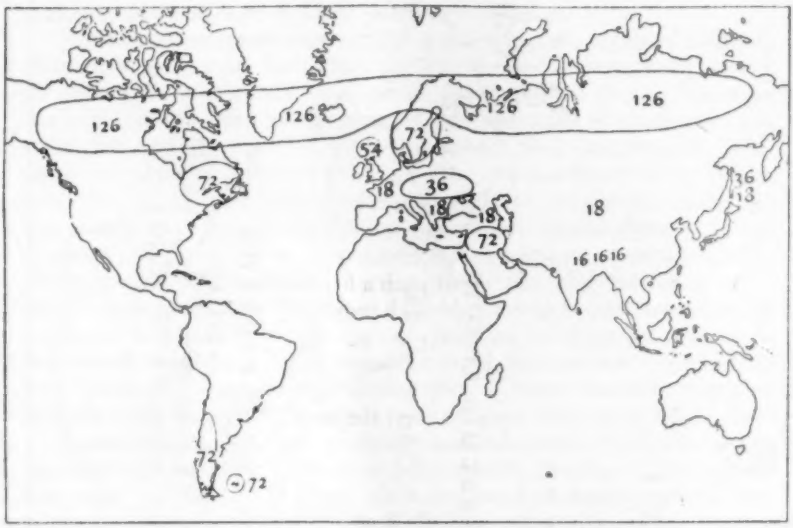
I have made a few maps of genera and sub-genera in which I have been interested. A map of the species of *Leucojum*, the Snowflakes, shows that most of the species have different basic chromosome numbers starting with 7 in the south-west Mediterranean area, other species with a basic number of 8 in Corsica and Sardinia, with 9 on the south coast of France, and the two best known species, *L. vernum* and *L. aestivum*, with the basic number of 11 cover northern Europe from Ireland to the Caucasus. This genus has no polyploid species and nearly all the species have different chromosome numbers. As far as I know, no hybrid *Leucojum* has ever been found either among wild plants or in cultivation, and this is, no doubt, due to the species having different chromosome numbers.

Among the Paeony species the position is different. It will be seen from the map of the European species of Paeony that there are diploid and tetraploid species. The basic number of the genus is 5, so the diploids have 10 chromosomes and the tetraploid 20. A suggestion has been made in my book, *A Study of the Genus Paeonia*, how the phenomenon came about among the European and Caucasian species that most of the diploid species are found on the islands of the Mediterranean and in a small area of the Caucasus, and the tetraploid species on the mainland. When polyploid plants arise in nature, they are at a disadvantage. A single plant may arise which has to compete with its diploid parents which are far more numerous, and with which it cannot breed, for if a tetraploid crosses back with a diploid, the result will probably be a triploid, which is usually sterile. Therefore the tetraploid under such conditions will die out unless it can grow with little or no competition



MAP 1—Map of Europe showing distribution of species of Paeonia with the diploid species marked 10 and the tetraploid species marked 20. Reproduced from the *Proceedings of The Linnean Society of London*, Part II, 1949.

and is self fertile. A virgin field is sometimes created by some catastrophe such as the Glacial Age, which is what I think happened with the Paeonies, or by severe earthquakes. In the wild, polyploid species are usually found where some such catastrophe has occurred, or where the area is a difficult one such as the Arctic or the deserts, where only plants of great vigour can survive. DR. JANAKI AMMAL has lately shown that numbers of polyploid species of Magnolias, Buddleias,



18 *Diploid* 54 *Hexaploid* 72 *Octoploid*
36 *Tetraploid* 126 *14 ploid*

MAP 2—Map illustrating the distribution of the species of the sub-section Eu-Farinosae of the section Farinosae of the genus *Primula*, showing the chromosome numbers of each species.

Reproduced from the *Proceedings of The Linnean Society of London*, Part II, 1949.

Rhododendrons, Honeysuckles and Camellias are congregated in a certain area of south-east Asia. This area, as CAPTAIN KINGDON-WARD knows by bitter experience, is the centre of violent earthquakes which have devastated whole mountain sides, creating virgin plant conditions. In cultivation, of course, the position is quite different because when a polyploid plant appears among other plants, it can be grown on under the best conditions and has no competition.

The map above illustrates the distribution of the species of the subsection *Eu-farinosae* of the genus *Primula* (WRIGHT-SMITH and FLETCHER, 1943) in which there are diploids, tetraploids and greater polyploid species. The basic number of all species of this subsection outside Tibet and Western China is 9. You will see that the well-known *Primula farinosa* is widespread across Europe and Asia; this is a diploid with 18 chromosomes. *P. longiflora*, a tetraploid, appears in a restricted

area in central Europe, and *P. scotica* which is a hexaploid with 54 chromosomes is found in Scotland. Further north in the more severe climate in Scandinavia there is *P. scandinavica*, which is an octoploid with 72 chromosomes; and octoploids are found in Labrador and Nova Scotia with *P. laurentiana*, in the Falkland Isles and Cape Horn with *P. decipiens*, and in the Alpine area of southern Persia with *P. capitellata*. Then in the most inhospitable climate of all, throughout the Arctic and sub-Arctic in Europe, Asia and North America there is one species, *P. stricta* with 126 chromosomes, 14 times the basic number of 9. It looks as if this species is a hybrid between *P. scotica* and *P. scandinavica*, $54 + 72 = 126$.

This is an example of a cross between two species, followed by chromosome doubling. Such an occurrence seldom happens and it can only continue to exist among wild plants, as I said above, if the new hybrid is self fertile and can overcome the competition of other plants either by happening to inhabit an area with sparse vegetation, as in the case of *Primula stricta*, or by being so strong that it is able to overcome the competition of its parents and other flora.

There is a classic instance of such a hybrid overcoming competition in *Spartina Townsendii*, a grass which grows on the maritime mud of the Hampshire coast. The original native grass *S. stricta* was once common throughout this area. In 1829 an American grass, *S. alterniflora*, was reported growing in this area; it was thought that it had been brought over attached to some ship. In 1883 the native plant was common and the American grass comparatively rare, but a new species, *S. Townsendii*, was reported growing in one locality in the same area. By 1930 the new species had spread all along the coast and also across the Channel; it had practically eliminated the native *S. stricta* and also the American species, which are now only found in small areas. The new species had 126 chromosomes and had arisen from hybridization between *S. stricta* with 56 chromosomes and *S. alternifolia* with 70 chromosomes, again a cross between two species, followed by chromosome doubling $56 + 70 = 126$. A chance cross had created a new species. This new species has been of great value economically and has been used by the Dutch to reclaim their land; it was planted in the Scheldt estuary in Holland where it reclaimed the land with great success. *S. Townsendii* is a good example of a polyploid which may arise from the cross of two different species where the cells of the hybrid fail to divide so that there are four or more sets of chromosomes, half of which come from each parent; such polyploids are called allopolyploids. *Aesculus carnea*, the well-known pink-flowered Chestnut, mentioned in CRANE'S lecture two years ago, is another instance of an allopolyploid, a cross between two species which has created a new species.

On the other hand, polyploids may arise from a single parent species where the cells fail to divide so that there are four or more sets of chromosomes of the same origin; these are called autopolyploids.

Buddleia Davidi is an example of this. This well-known plant from China is a tetraploid with 76 chromosomes (19×4). Already there are a number of variations in the colour of the flowers of this species offered in trade catalogues, although the wild plant was only introduced

in 1890. No doubt if seed were raised from this species on as great a scale as the greenhouse Cyclamen, many more variations would be obtained. The greenhouse Cyclamen, is, I think, also an example of an autopolyploid. These greenhouse forms have been evolved from the species *Cyclamen persicum* by breeders by selection. Breeding began seriously in the middle of the nineteenth century and has been continued in several countries with increasing momentum ever since. No interspecific hybridization has taken place and yet innumerable variations of colour and form have arisen. What is the explanation? The cytological history of the Cyclamen species is full of interest. All the species are indigenous to the Mediterranean area, with one species extending northward into central Europe. The chromosome numbers according to DE HAAN and DOORENBOS (1951) are as follows:—

Cyclamen repandum	2n = 20	*Cyclamen neapolitanum*	2n = 34
„ *cretensis*	2n = 22	„ *europaeum*	2n = 34
„ *orbiculatum* var. Coum	2n = 30	„ *persicum*	2n = 48
		„ *graecum*	2n = 84

This is an unusual sequence. Messrs. DE HAAN and DOORENBOS suggest that the genus is an ancient one, and through the ages many species which might have connected up the present-day species, have died out. This is very likely, as the Mediterranean is an area well known to contain relict plants from pre-Glacial times. These authors also suggest that the species with 20 chromosomes might be tetraploids with a basic number of 5, and those with 22 chromosomes could have originated from a species with 20 chromosomes by the doubling of two chromosomes. *C. persicum* has 48 chromosomes, while some of the greenhouse varieties have 96 chromosomes. I suggest that this species is also a polyploid and that the explanation of the great variation seen in the greenhouse plants is due to the wild plant with 48 chromosomes being an octoploid with 8 times the basic number of 6, and some of the horticultural varieties with 96 chromosomes having 16 times the basic number of 6. *C. persicum* and *C. graecum* with 84 chromosomes have very small chromosomes, which is often a sign of polyploidy. It may be that the basic numbers of the genus are 5 and 6, and that this has come about in the same way as in another relict genus *Leucojum* which I have already described. An octoploid with 8 times each of the 6 basic chromosomes would make an astronomical number of combinations possible. Polyploidy is one way in which variation may come about in plants and another is by 'bud sports' when a new or different form appears on part of a plant or shrub.

The explanation of the reasons for bud sports in the garden Chrysanthemums is interesting. The basic chromosome number of Chrysanthemum species is 9, and the garden and greenhouse forms are hexaploid with around 54 chromosomes. Bud sports have often arisen and have come about by the loss or gain of chromosomes or fragments of chromosomes, so that varieties have all numbers from 47 to 63. When these changes of chromosome numbers occur in bud sports, they will always give rise to periclinal chimaeras, the new sport being the outside

cover and the inside being composed of the parent plant or vice versa. This was confirmed last year in an unexpected way. Chrysanthemums are dipped as a treatment for eelworm for five minutes in water at 46° C. After this treatment a grower had 10 to 20 per cent. of pink sports from 'Bronze Favourite.' Therefore this clone must have been a chimaera made up of two types, and the drastic treatment to get rid of the parasite had led in some cases to the elimination of the outside cover and the discovery of another variety on the inside.

The cytological history of other common garden plants will be given in the second lecture, and will illustrate the different phenomena which we have been discussing; it will show how the improvements have taken place and the lines on which it may be possible to make further improvements.

(*To be concluded.*)

THE PHENOMENON OF AUTUMN COLOUR

Lanning Roper

TWO of the finest gardens in England for autumn colour are Sheffield Park in Sussex, and the Arboretum at Westonbirt, Gloucestershire. In fact, there are few places anywhere in the world that can compare for effective layout and fine colouring trees and shrubs. From someone familiar with the dazzling autumn foliage of Canada and New England this is high praise, but it is sincere, for these gardens show what can be achieved with the necessary forethought and conscious planning.

On the eastern coast of the United States whole valleys and mountain sides are a blaze of scarlet and yellow in the autumn and every roadside is a curtain of brilliant colour. Indian summer is the delightful name for this beautiful spell of weather, when the nights are crisp and clear with a touch of frost, the days warm and golden and the air fragrant with the scent of Wild Grapes and wood smoke. The Sugar Maples, Dogwoods, Sumachs, Red Oaks and the Sweet Gums are in their full glory as is even the detested Poison Ivy (*Rhus Toxicodendron*) whose flaming glossy leaves ramp over the ground and festoon trees and stone walls. Some years the colour is a little more brilliant than others but it is always spectacular.

In England such brilliant scenes are not so easily achieved. The autumn colouring is more subdued in tone. The Beeches of the New Forest are a burnished gold, the Poplars and the Birches pale yellow and the Oaks warm reds and brown, but the dazzling blaze of vibrant colour just does not happen unless it is planned for as it was done by the late SIR GEORGE HOLFORD and ARTHUR J. SOAMES.

What are the causes of the sudden change of colour in foliage and what are the factors? It is partly brought about by the accumulation of waste products within the leaf, namely sugars and minerals. As the production of chlorophyll ceases, the green colour fades rapidly and a yellow pigment, xanthophyll, becomes more evident for it is no longer

masked by green. This it is which gives the lovely golden tints to the Birches, Elms and Ginkgos and the russet tones to the Hornbeams and Beech. The third substance causing red coloration, erythrophyll, is not present like the two above but is manufactured from waste sugars and tannin under the action of sunlight. Actually this process, unlike most chemical ones, is accelerated by low temperatures, and it eventually brings about the scarlets and crimsons of the Acers, Cornus and Vacciniums on the hillsides. But very little is known about the process of change.

In England the season for autumn colour lasts several months and sometimes as long as three. Among the first trees to change are the lovely Stewartias, which are often as beautiful in September as they are when in full flower. There follows an endless variety of lovely things, colouring to varying degrees in different localities. This matter of variation cannot be emphasized too strongly. A species may be superb in one area and poor in another. Often there is no evident explanation. In the autumn of 1950, Eucryphias were on the whole disappointing at Windsor and Wisley, but not far away at Tower Court they coloured superbly in shades of glistening orange blended red. Similarly the *Nyssa sylvatica* at Sheffield Park were unbelievably brilliant, but those at Westonbirt were pale by comparison.

Just as there is variation from place to place, so there is great variation from year to year. What is good for one autumn may be disappointing the next. And, because Acers and Sycamores are poor it does not necessarily follow that Vacciniums and Caryas will be poor also. Always there is the element of chance.

At Westonbirt there is colour from early September until late November or early December, usually reaching its peak in the third week of October with the Acers, Cercidiphyllums, Photinias, Caryas and Rhuses at their best. Strangely enough, this varies very little from year to year and the famous "Colour Parties" which were arranged by the late SIR GEORGE HOLFORD each autumn when the Arboretum was at its most brilliant could usually be anticipated to a nicety. At Sheffield Park the period of colour is also a long one as the result of the great variety of material and of careful planning.

Weather is certainly a factor. The best colour seems to follow a dry summer followed by plenty of rain early in September to freshen the leaves and to hold them on the trees, excessive dryness causing the leaves to fall prematurely. On the other hand a wet summer with the attendant lack of sunshine is disastrous. In September the change of temperature is important, a few degrees of frost being required. Too severe a frost is fatal as the leaves wither and fall rapidly thereafter. In the autumn of 1951 certain counties had a sudden sharp drop of temperature which brought the display to an end very quickly.

After the leaves have begun to turn, good weather is necessary as rain and gales soon sweep even the most beautiful leaves to the ground, but these two factors are not alone responsible for the dropping of the leaves. It has already been anticipated in the plant for many weeks by the formation of a special abscission layer of cells below the point of attachment of the petiole. Meanwhile, as the chlorophyll diminishes,

the leaf has been delivering back to the tree a quantity of nitrogen, potash and phosphorus. All these are not lost to the tree with the dropping of the leaf.

From the above it is obvious that the American climate is better adapted to the inducement of colour. Secondly, it so happens that many of the large-scale natural plantings in the United States are composed predominantly of fine colouring trees and shrubs. However, because of the more rapid approach of winter, the period of display is shorter.

There is always considerable difference of opinion as to whether plants colour better in acid or chalk areas. Of course, it is well known that some of the finest colouring plants such as brilliant Enkianthus, Vacciniums, Fothergillas, *Oxydendron arboreum*, etc., will not tolerate lime. There is a fine specimen of the last in the Wild Garden at Wisley. Others such as Berberis, Acers, Prunus, and Betulas are happy on chalk as a visit to Highdown in the autumn reveals. Anyone who has seen one of the late MR. MARCHANT'S exhibits at the Society's autumn shows realizes that his plants coloured exceptionally well, and he was convinced that it had something to do with the lime-free soil in his nursery. At Sheffield Park the soil is also on the acid side and the Nyssas, Photinias and Vacciniums grow happily against a background of Pieris, Kalmia and giant Rhododendrons.

To confuse the issue still further, Westonbirt adds disconcerting evidence. Here the Arboretum and Silkwood which cover an area of over 400 acres are partly lime free, while the rest is the usual alkaline soil of the Cotswolds. Autumn colour is equally fine in all parts of the garden, and try as I would I could find no marked difference. From the above the evidence does not favour either one more than the other. There is the theory that autumn colour is best where there is considerable moisture in the soil and after careful consideration of various gardens there seems to be some grounds for this opinion.

When it comes to planting, in addition to the problem of selecting the plants themselves, there are the factors of design, texture, and form to be considered. The shape and habit of each tree and shrub must be visualized at maturity and the number of specimens in each group to attain the desired mass. Unfortunately the task is more difficult for the gardener than the painter. The latter is dealing with a given composition, while the gardener is confronted with a series of variables for as trees grow the composition changes and as the seasons vary so do the colours.

For overall mastery of these problems Westonbirt and Sheffield Park are in a class by themselves, having been conceived on the grand scale with the greatest artistry. To-day, both are gardens of maturity. Sheffield Park is fortunate in the lie of the land which has made possible five lakes on different levels and about which the garden layout has been developed. It is much more a garden in the true sense with vistas over well-kept lawns, architectural and sculptural details such as bridges and urns, and always the fascinating reflections which add so much to the interest and sense of scale in any garden. Lilies, Ferns, Iris, Roses, and a few herbaceous subjects are featured but they have been subordinated to the trees and shrubs.

The finest colour at Sheffield Park is provided by the *Nyssa sylvatica*,

and the *Photinia villosa*. The former is a North American tree, uncommon in England, known variously in its native habitat as Tupelo, Pepperidge, Sour Gum and Black Gum. It is best grown from seed as the Sheffield Park trees prove, but it can be layered if patience is exercised. It particularly dislikes transplanting so it is well to move it when young into its permanent position, which should be a moist spot, even a little swampy. The trees here are about thirty years old and show great variation in size and habit. Some are low and spreading; others narrow and upright or even conical. All have rather pendulous twiggy branches but again this is a variable character. The seed came from Vilmorin in France, but a few were propagated from layers. The glossy oval to oblong leaves turn brilliant reds and scarlets of unbelievable intensity. Last year in the first week in November some trees were at their best, others had passed their prime and a few were still colouring. This shows the variation of a single species in the time of colouring. This is partly due to position and partly to the habits of the individual tree. In the United States it is not uncommon to see a few branches of brilliant colour on an otherwise green tree. Certainly *Nyassa sylvatica* is an unforgettable sight at Sheffield Park, where the conditions are exactly right and the edges of the lakes provide perfect sites for them. (Figs. 143 and 148).

The other remarkable tree is *Photinia villosa*, a member of the family Rosaceae. Photinia is taken from the Greek word *photeinos*, shining, which is an allusion to the lustrous leaves. These colour superbly in autumn and masses of it at Sheffield Park are of such brilliance and intensity of colour that it is hard to conceive of anything better in the category of colouring plants.

Parrotia persica is another excellent subject as its leaves are highly polished and turn a fine scarlet. It is particularly attractive because of its extraordinary habit, its long oblique branches often growing in fantastic shapes. There are fine specimens at Sheffield Park and at Westonbirt there is an interesting group in marked contrast to the fastigiate conifers behind both in form and colour (Fig. 144). The huge specimens near the entrance at Kew are equally effective as they have been well planted with space to develop and against a fine dark background of Pines.

A moisture-loving tree which provides beautiful subtle autumn colouring is *Taxodium distichum*. It turns a lovely yellowish-fawn colour with a pinkish cast. At Sheffield Park this fine species is planted at the waterside in conjunction with the gold of the white-stemmed Birches and the plum of *Berberis Thunbergii*.

Much as the eye is excited by the brilliant reds and oranges and yellows, the softer colours are equally beautiful and often the contrast of the two is effective. At Sheffield Park the carpet of Bracken and dry leaves forms a wonderful foil to the apricots and scarlets of Berberis or the old rose and mauve pinks of *Euonymous alata* and Vacciniums while at Westonbirt the autumn foliage is in marked contrast to the brilliant green vistas of the rides, making a quite different effect.

The larger trees which offer valuable autumn display fall into colour groups. One of the finest of the yellows is the Sycamore, especially the graceful *Platanus orientalis*. At Westonbirt huge

Colour Photograph, J. E. Downward

AUTUMN COLOUR

FIG. 143—*Nyssa sylvatica* at Sheffield Park (See p. 408)

Photo, J. E. Downward

FIG. 144—*Parrotia persica* with *Libocedrus decurrens* at Westonbirt (See p. 408)

FIG. 145—*Cercidiphyllum japonicum* with *Acer japonicum* and conifers at Westonbirt (See p. 411)

Photo, J. E. Downward

Colour Photograph, J. E. Downward

FIG. 146—*Nyssa sylvatica* with ***Acer japonicum*** and Vaccinium species at Sheffield Park

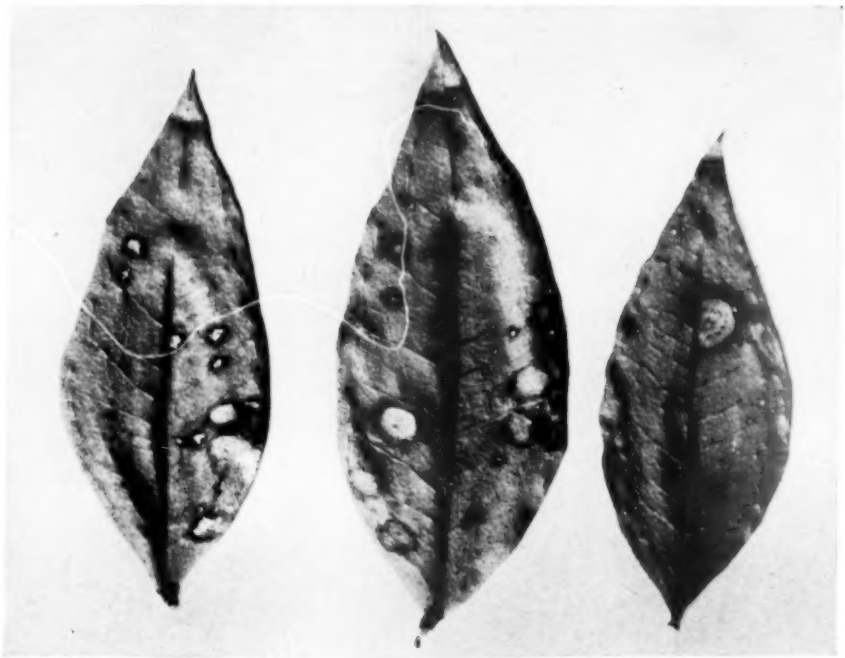
FIG. 147—*Acer japonicum* with *Cedrus atlantica glauca* at Westonbirt (See p. 410)

Colour Photographs, J. E. Downward

FIG. 148—The top lake at Sheffield Park showing *Acer japonicum* and *Nyssa sylvatica* (See p. 408)

FIG. 149—Defoliation of young Myrtle plant caused by *Pestalotia decolorata* (See p. 413)

LEAF SPOT DISEASE OF MYRTLE



Photo, R. P. Scase

FIG. 150—Leaf Spot of Myrtle due to *Pestalotia decolorata* (See p. 414)

Photo, J. E. Downward

FIG. 151—*Paeonia suffruticosa* 'Mrs. George Warre,' **A.M.** May 20, 1952. Shown by COLONEL F. C. STERN, F.L.S., V.M.H. (See p. 423)

Photo, J. E. Downward

FIG. 152—*Lilium* 'Bellingham Hybrid' var. 'Shuksan,' **F.C.C.** July 8, 1952. Shown by THE COMMISSIONERS OF CROWN LANDS, Windsor **(See p. 422)**

specimens with pendulous branches nearly reaching to the ground were sheets of beaten gold, dazzling in the sunlight. *Liriodendron tulipifera*, more upright in habit, were of a colour equal to the most brilliant yellow Tulip. The enormous specimen at Stourhead last October was unbelievable in its brilliance. Beeches and Elms are more subdued but no less beautiful. Unfamiliar to many English gardens are the Hickories of North America, another feature of Westonbirt, and a tree which is being liberally planted in the developments at Windsor. The two outstanding species are *Carya glabra*, or Pignut, as it is commonly called, and *C. ovata*, the Shagbark of pioneer literature. The last is the best of the fruiting Caryas next to the Pecan. The large compound leaves turn a rich butter-yellow and are highly decorative although they make an untidy lawn tree as they shed their leaves early and over a long period. They are not widely grown in this country but they are to be commended. Those who have seen them in autumn in their full glory will need no encouragement. Equally effective is the bold foliage of the Aesculus, especially the handsome *E. turbinata*.

For reds the Oaks, particularly *Quercus coccinea*, are outstanding. Like the other Oaks it colours late (the red gradually fading to a rich reddish-brown), and holds its leaves well on into the winter, in this respect resembling the Beech. There is a fine planting of young trees in the Great Park at Windsor, and at Westonbirt they have been skilfully combined with other subjects. The reds are not as brilliant as those of the Acers but the richness of colour and the persistence of the leaves makes them very desirable. At both Westonbirt and Sheffield Park there are fine specimens of *Q. rubra* and *Q. coccinea splendens* which show the true beauty of the genus in maturity.

For even more brilliant colouring, the Maples must take first place. In the United States by far the most spectacular of the genus is *Acer rubrum*, the Scarlet or Swamp Maple. It is indescribable in its intensity, filling the swamps and valleys with glowing reds. *A. saccharum*, the Sugar Maple of the Eastern States, is another fine species, grown for the sap which is tapped in the early spring and boiled down to make syrup and maple sugar. In New England it is much used as a street tree because of its dense regular habit and its foliage, which in autumn runs the gamut of colour from yellow through the orange and tomato shades to scarlet. Later the sidewalks and lawns are a brilliant carpet and the air is a mass of whirling sheets of colour tossed in the breeze. Not only are the leaves more vivid than Acers in England but they are further intensified by the brilliance of the October sunshine and the contrasting background of the cloudless blue sky.

Although these two Acers unfortunately do not give a consistent performance in this country, at Westonbirt they are very fine. Certainly it is worth growing them, *A. rubrum* var. *sanguineum* being the first to turn about the end of August.

In England the Acers from China and Japan are far more reliable for colour than those from the West. Perhaps the most beautiful of all is *A. nikoense*, a native of Japan and Central China, which forms a tree 40–50 feet tall in the wild. In October the trifoliate leaves turn the most wonderful shades of red and purple, indescribable in their richness. So

popular was this tree at Westonbirt, that they were planted copiously. There are fine specimens at Sheffield Park and in many other gardens. As it is not a fast grower, it is excellent for smaller gardens where a tree of great beauty is needed. Closely related is *A. griseum*, which is not only beautiful for its fine foliage in autumn but for its handsome bark which peels and flakes like *Prunus serrula*, adding interest in the winter months.

Somewhat dwarfer are *Acer japonicum* and *A. palmatum*, which may form trees up to 25 feet in height, but this is exceptional. They are generally small bushy trees forming fascinating shapes. *A. palmatum*, long cultivated by the Japanese, has been produced in a bewildering number of forms and varieties, including *septemlobum*, *dissectum*, *sessilifolium*, *elegans*, *atropurpureum*, *linearilobum* and *ornatum*, giving great variation in leaf shape, texture, coloration and habit.

At Westonbirt all these are to be found in abundance, many of them to-day well over seventy years old and having a spread of as much as 35 feet. They like a protected position in good loam or peaty soil. Greatest enemy to *A. palmatum* is late spring frost which cuts back the more delicate forms. This has been overcome by planting in shady secluded places where the taller planting keeps off the frost and forms a shield against the bitter east and north winds.

Probably the most spectacular of all is *A. palmatum septemlobum* 'Osakazuki' which for a brilliant red is unrivalled, especially when the sun filters through the leaves. It is a reliable plant, equally beautiful at Sheffield Park, Westonbirt, or at Underway, MR. NORMAN HADDEN'S interesting garden at Porlock in western Somerset.

The finest planting for autumn colour in England is in the writer's opinion the Acer glade at Westonbirt. Here hundreds of Japanese Maples in variety have been admirably grouped along a grassy path under a canopy of large trees. Most of these were seedlings, raised and carefully selected by the late SIR GEORGE HOLFORD. The poorer ones were discarded. The colours range from the palest apricots, pinks and golds, to fiery scarlets, burgundy and plum. These were skilfully blended and not planted at random as one might at first suspect. All plants have the advantage of being on their own roots, and are as a result more vigorous growing and long lived than grafted plants.

Another lovely sight is the grouping of *A. japonicum* against the glaucous blue of Cedars near the entrance, where again a certain amount of shelter is provided (Fig. 147).

It is impossible to enumerate all the fine colouring trees and shrubs but certain ones must be mentioned. The genus Rhus is a must, whether it be the elegant *R. cotinoïdes* (the Chittam Wood of Tennessee and Alabama) with its claret and coppery purple tones showing great variation on the same tree, or the much larger *R. Potanini*, a native of China, which takes on a brilliant scarlet in favourable years. *R. typhina*, the Stag's Horn Sumach, another native of eastern North America, is one of the handsomest of all with its deep maroon fruit clusters on the female plants and the large, brilliant, orange to scarlet, pinnate leaves, sometimes nearly 3 feet in length. It must either be planted where it can spread into a large natural group, as it suckers readily, or kept under strict control.

Perhaps the most distinguished of all autumn colouring trees is

Cercidiphyllum japonicum, a native of both Japan and China, where it has been known to form a tree up to 130 feet in height. Its colour in October is indescribable and unpredictable. Sometimes it may be a dull gold but at its best it is a shimmering mass of pale apricot and rose and crimson. One large tree at Westonbirt in the autumn of 1951 was for all the world like a fountain of colour, shining and rippling in the breeze with infinite variation, beautifully set off against a dark background of evergreen, again showing SIR GEORGE HOLFORD's great artistry and infallible sense of composition (Fig. 145). Cercidiphyllum likes a damp position.

Of the dwarfer plants, *Fothergilla monticola* and *F. major* are among the most spectacular, the former colouring rather the better of the two. There is a particularly fine specimen at Wisley in the Wild Garden. It is attractive when used in the front of the shrub border, along a woodland path or in the rock garden, as at the Botanic Garden, Edinburgh, where it is particularly effective.

The Vacciniums and Gaylussacias are also superb among the low growing shrubs. At Sheffield Park, *Vaccinium corymbosum*, and *V. pennsylvanicum* and *Gaylussacia baccata* have naturalized so happily under the canopy of trees in the light peaty soil that the scarlet and purple masses in autumn are very beautiful. These plants are too little known in gardens and they lend themselves admirably to small natural plantings where ericaceous conditions exist. Enkianthus can also be dazzling in autumn and combines well with the above.

Euonymus alata is another particularly effective plant with its pinkish-purple foliage in autumn. It is subtle in its coloration and contrasts particularly well with the grey of *Hippophae rhamnoides* and *Pyrus salicifolia*.

No account of autumn colour is complete without mention of fruiting plants but that would itself provide the subject for a separate article. The range in colour is enormous, including white, pink, blue, purple, red, orange, yellow and black. What could be lovelier than the pinks of *Sorbus Vilmorinii*, *Pernettya mucronata*, or *Euonymus yedoensis* combined with the china-blue of *Symplocos paniculata* or *Gaultheria Veitchiana* or the mauve-pink of *Callicarpa Giraldiana*? For reds and scarlets the choice is even more bewildering but certainly *Viburnum betulifolium*, *Cotoneaster* × *Watereri*, *Pyracantha crenulata* and *Rosa Moyesii* must come near the top of the list. At Westonbirt there is such an abundance of berries that the birds do not seem able to cope and certain species are never favoured by them.

Readers of this article will probably feel that one of the best of the autumn colouring plants has been omitted. *Prunus Sargentii* should have been put at the top of the list or *Crataegus prunifolia* as it colours at Kew should have been mentioned. The lovely hedges of *Rhododendron luteum* which colour so magnificently at Wisley are hard to surpass. *Liquidambar styraciflua* certainly should have been singled out. As autumn approaches the possibilities are infinite and each gardener must choose his material in accordance with the conditions of soil and climate and the extent of his own park or garden. There is a wealth of material available. Certainly a visit to Sheffield Park, Westonbirt, Windsor Great Park, Winkworth Arboretum or Stourhead, to name only a few, provides more inspiration than words.

NOTES FROM FELLOWS

Caesalpinia japonica

GARDENERS who are interested in uncommon shrubs may like to know that *Caesalpinia japonica*, an elegant woody plant seldom seen in gardens in this country, is flowering freely in the gardens of Wye College in East Kent at the present time (May, June). It was raised from seed sown in a cool greenhouse, and planted out in the spring of 1950 in a sheltered corner against a sunny south wall—the soil is a light brick earth overlying the chalk at the foot of a spur of the North Downs. It came through the winter months with only a light protection of branching pea-sticks, and took two years to come into flower.

This species of Caesalpinia grows about 15 feet high, and is a wide-spreading scandent deciduous shrub needing some support; it is formidably armed with stout decurved thorns. The delicate pale green mimosa-like leaves are 12 or more inches long and doubly pinnate, the pinnae being in three to eight pairs, each carrying twelve to twenty leaflets about three inches in length. The wood is extremely brittle, and the hooked branches are easily broken if one brushes against them. The flower buds appear in early May, and the canary yellow flowers are about 1¼ inches across and are borne on 2 inch stems in erect racemes 12 inches long, up to thirty flowers to each raceme. They have five petals, four more or less equal in size and the fifth and upper petal much smaller and pencilled with bright scarlet markings—the protruding stamens are scarlet also.

Only two species of Caesalpinia, *C. japonica* and *C. Gilliesii*, are recommended for planting in the open in England, although at least forty species of trees and shrubs are to be found in tropical and sub-tropical regions. A third species, *C. sepiara*, grows well in a cool greenhouse, and has much larger and very spectacular flowers. These plants were at one time put into the order of Leguminosae, but HUTCHINSON divides the order into three families, one being the Caesalpiniaceae; the flowers of the plants in this group are unlike the pea flowers in that the petals are almost even in shape and size, with no standard and no keel petals, The genus was named after the 16th century Italian botanist, ANDREAS CAESALPINUS, and *C. japonica* was introduced into this country from Japan towards the end of the 19th century by Messrs. Veitch, who according to BEAN first flowered it in their nursery at Coombe Hill in 1887.

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Wye, Nr. Ashford, Kent.

Old Fashioned Roses

I have noticed several times in descriptions of "old roses" that the lovely and most interesting rose 'Cardinal de Richelieu' is called "velvety crimson." Nothing could be more misleading than this, for it is of an indescribable heliotrope colour, varying from a greyish mauve to purple, with an admixture of pink or crimson in splashes or markings. My original plants came from a nursery in Ireland, and grew into large bushes, from which root suckers are easily propagated.

LADY A. M. MARTINEAU.

TWO LEAF SPOTS OF MYRTLE NEW TO GREAT BRITAIN, caused by the fungi *Pestalotia decolorata* and *Cercospora Myrti*

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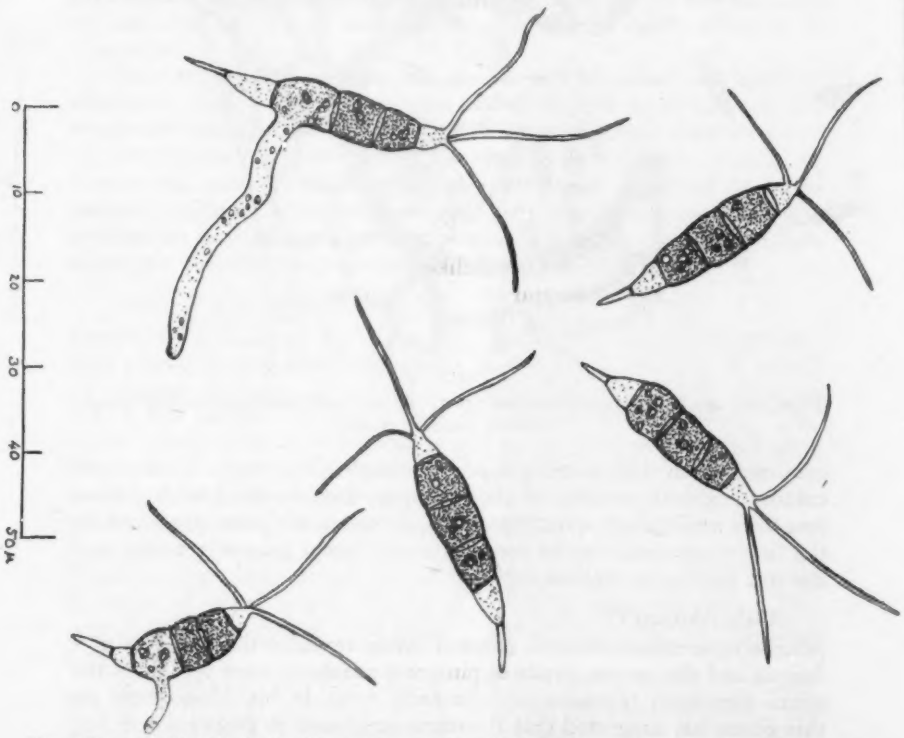
(*Wisley Laboratory*)

I Myrtle Leaf Spot due to the fungus *Pestalotia decolorata* Speg.

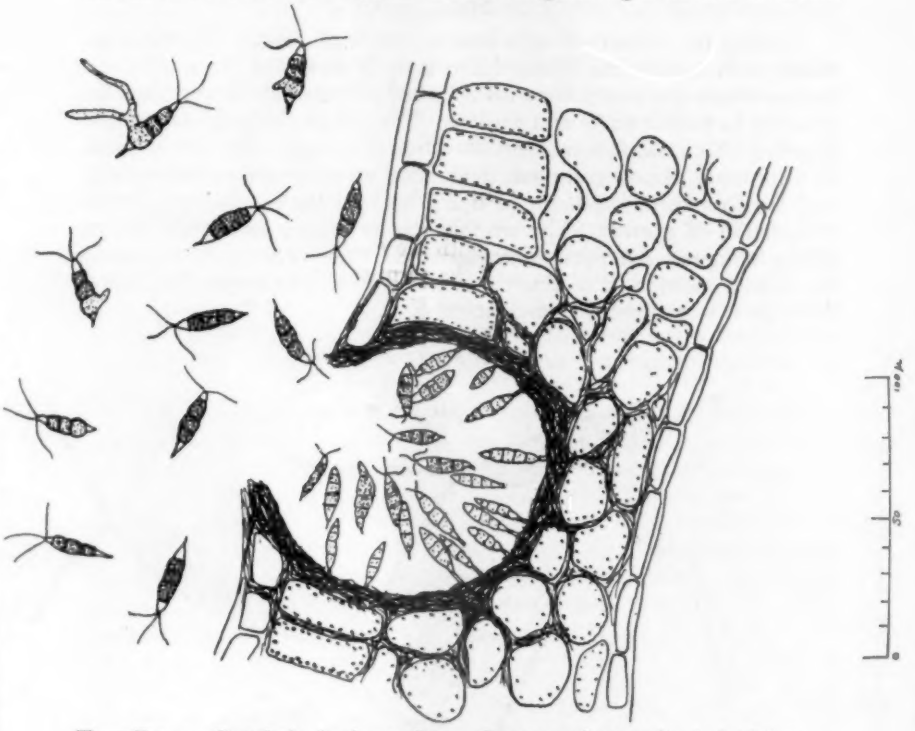
During the winter of 1950 several plants of Myrtle (*Myrtus communis*) were sent to the Wisley Laboratory from one of the south coast resorts where the plants were being raised in considerable numbers for planting in public parks and gardens. The plants showed a severe leaf spotting which was followed by defoliation (Fig. 149). The serious, and, in some cases, almost complete, defoliation severely weakened the plants and led to a certain amount of dying back of the shoots and general retardation of growth. The trouble was extensive among the young plants being raised in pots under glass and seemed to occur chiefly during the winter months. The disease in this case was so severe that it was felt that it warranted further investigation.



TEXT FIG. 1—*Pestalotia decolorata* Speg. Germinating spores. Camera lucida drawing.

THE SYMPTOMS

In the earliest stages the leaf spots are very small, appearing as pin-point size dark red or reddish-purple spots on the leaves. The spots increase in size fairly quickly, the centre of each becoming a light cream colour while the outer zone remains dark red, and may occur anywhere on the leaves but are often found at the leaf tips and margins. They are usually round or oval in shape and up to about $\frac{1}{4}$-inch across, but often extend or coalesce to involve large areas of affected leaves. When this occurs the affected area appears as an irregular light brown or cream



TEXT FIG. 2—*Pestalotia decolorata* Speg. Spores and acervulus in leaf tissue. Camera lucida drawing.

coloured patch with a reddish-purple margin (Fig. 150). If the light coloured central portions of the leaf spots are examined with a hand lens very small black spots composed of masses of spores produced by the fungus parasite may be seen. Affected leaves gradually yellow and die and defoliation follows rapidly.

THE PARASITE

Microscopic examination of affected leaves revealed the presence of a fungus and the spores, produced in great numbers, were typical of the genus Pestalotia (Pestalozzia). Recently GUBA in his Monograph on this genus has suggested that the name be altered to Pestalotiopsis but the older name is being retained in this account.

From affected leaves young leaf spots were cut and cultured on agar plates to bring the parasite into pure culture. Grown on a medium of prune agar (*p*H 6·2) and incubated at 21° C. the fungus grew well, the mycelium being rather sparse and transparent and tending to grow over the surface of the medium rather than extending into the agar. Cushions of spores appeared very readily in about a week on plates in the light. Spores formed less readily in cultures kept in darkness. They also formed in much greater numbers in cultures in petri dishes than in cultures on test tube slants. The spores are of the typical Pestalotia type being shortly conical in shape and are 4-septate, the three central cells being a dark olive green and the end cells hyaline. The apical cell bears two or three (rarely four) long (about 15μ) simple, hyaline setae while the basal cell tapers into a simple, hyaline stalk about 6·0μ in length (Text Fig. 1). In size the spores vary in length from 21·0μ to 35·5μ, averaging 23·0μ, and in width from 5·0μ to 7·5μ averaging 6·8μ (100 spores measured). The spores are borne in nature on the leaves in fruiting bodies of the acervulus type (Text Fig. 2). In culture they appear in cushion-like masses on the surface of the agar and the individual dark coloured spore masses may be seen clearly with the naked eye.

The spores germinate quickly, the germ tubes normally originating from the first coloured cell at the stalk end (Text Fig. 1). Just prior to germination this coloured cell swells and becomes lighter in colour, the original hyaline cell at the inferior end of the spore seeming to disappear.

From these characteristics the fungus was identified as *Pestalotia decolorata* Speg. The fungus was first described by SPEGAZZINI (1) whose account appears verbatim in SACCARDO's *Sylloge Fungorum*.

The fungus has been recorded as the cause of galls on Myrtles in Cyprus (2) although these galls were previously reported to be of bacterial origin (3). The author has not seen any signs of gall formation on Myrtles in this country. The fungus is also known in the U.S.A. where it is recorded as the cause of a leaf spot of Myrtles (4).

INFECTION EXPERIMENTS

Spores of the fungus (taken from agar cultures) in suspension in water were placed on the leaves of healthy Myrtle plants growing in a cold greenhouse. In some cases the leaves were first wounded by stabbing with a fine needle and others were infected without wounding. The treated plants were covered with a bell-jar for forty-eight hours after inoculation but were otherwise given normal treatment. In the case of wounded leaves the typical spots appeared in ten days while on the unwounded leaves infection was a little slower, taking about fourteen days. Young leaves were more readily infected than older leaves. Following experimental infection of certain leaves on the plants natural infection of other leaves on the same plants soon followed. The typical Pestalotia spores were easily recovered from any of these leaf spots.

An interesting point is that although infection occurred readily during the autumn and early winter, infection experiments during the spring and summer were completely unsuccessful.

CONTROL

It is suggested that where this disease occurs the fallen leaves should be swept up and burnt, followed by spraying the plants with a colloidal copper spray. A further spraying in the spring to protect the young shoots is also advisable.

Tests along these lines by spraying with colloidal copper resulted in no injury to young Myrtle plants either in the open or when under glass.

II A Leaf Spot of Myrtle *Myrtus communis* due to the fungus *Cercospora Myrti* Eriks.

In the summer and autumn of 1951 specimens of Myrtle showing a leaf spot were sent to the Wisley Laboratory from two places in the south of England. The symptoms were not the same as those noted on specimens sent the previous winter and it was therefore decided to investigate this trouble as well.

THE SYMPTOMS

The first sign of this leaf spot is the appearance on the foliage of small, light yellowish-green coloured spots which quickly enlarge and become dark reddish-purple in colour surrounded by a light chlorotic halo. At this stage the spots are normally round and about ¼-inch across but as they increase in size they become irregular in shape and often coalesce so that large areas of the leaves are affected, the leaf tips often being attacked, though the spots may occur anywhere on the leaves. Although the central portion of these leaf spots may become brown and necrotic, no black spore masses can be seen if the spots are examined with the aid of a hand lens. In this case the spores are produced on the under surfaces of the leaves and if these are examined a grey, downy growth will be seen on the affected areas. Severely affected leaves may fall but defoliation is usually neither so rapid nor serious as in plants attacked by *Pestalotia decolorata*.

Myrtle leaves affected with this leaf spot, which shows as dark reddish-purple spots or blotches surrounded by a light coloured halo, can easily be distinguished from those attacked by *Pestalotia decolorata* in which affected areas show light brown or cream coloured centres with a distinct *dark* coloured marginal zone.

THE PARASITE

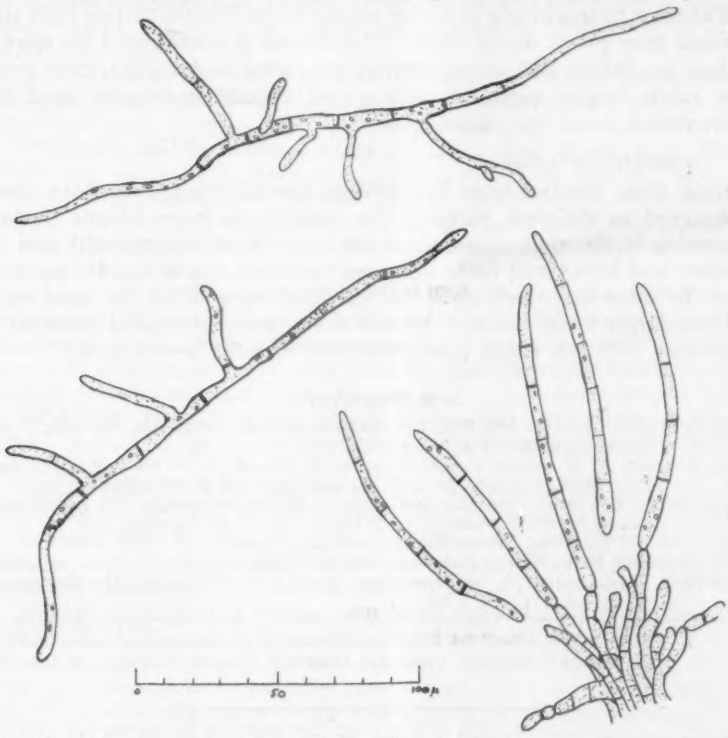
Young leaf spots were cut out and cultured in agar plates to obtain the fungus in pure culture. The fungus grew readily on a medium of prune agar (*p*H 6·2) incubated at 21° C., and formed a very dense, fluffy, grey mycelium. Spores appeared in about ten days and having regard to the morphological characters described below the fungus was identified as *Cercospora Myrti* Eriks.

The spores are borne in tufts on short, unbranched conidiophores which protrude through the stomata of the leaves. The spores are long, filiform and slightly curved. They are smooth, hyaline and have 3 to 6 transverse septa, in size being from 58·5μ to 105·3μ long, averaging

78·0μ and uniformly 3·9μ wide (100 measured). They germinate in about 24 hours, germ tubes first growing out from the end cells, so that the spores appear to elongate in length, and later from the other cells (Text Fig. 3).

HISTORY OF THE FUNGUS

Cercospora Myrti was first described by ERIKSSON and his description is reported in SACCARDO's *Sylloge Fungorum* (5). The fungus was recorded by PAPE (6) in Germany in 1930 as causing a serious leaf fall in Myrtles



TEXT FIG. 3—*Cercospora Myrti* Eriks. Germinating spores. Camera lucida drawing.

grown under glass but he gave no spore measurements in the text nor any scale in his drawings. The disease has also been noted as occurring on Myrtle foliage in the Isle of Port-Cros (7).

INOCULATION EXPERIMENTS

Spores of the fungus in suspension in water were placed on the leaves of healthy Myrtle plants growing in pots in the greenhouse at a temperature of 45–50° F. The spores were scattered on the leaves, in some cases on the upper and in others on the lower surfaces of the leaves both with slight wounding with a needle and without wounding. The plants were covered with a bell-jar for forty-eight hours after inoculation but apart from this normal cultivation was given. The typical leaf spots developed

in about a week on wounded leaves and about ten days on uninjured leaves. Infection occurred more readily on leaves inoculated on the under sides and older leaves were more readily attacked than the young leaves.

CONTROL

This disease can be controlled by collecting and burning all fallen leaves followed by spraying the plants with a colloidal copper or Bordeaux mixture spray. Spraying may need repeating several times at intervals of about a fortnight and in severe attacks of the disease cutting back the plants may prove worth while. The disease is encouraged by warm, close conditions and where Myrtles are raised under glass, care must be taken to give sufficient spacing and ventilation to give good air circulation round the plants.

OBSERVATIONS

Since these diseases were first noticed several other cases have been observed in different parts of the country on large Myrtle bushes growing in the open where the older leaves were infected with one or other, and sometimes both, fungi, so that both diseases could be seen on the same bush and often the two kinds of spot on the same leaf. These larger bushes seem to be able to stand a good deal of infection if growing well, but young plants are liable to suffer severe injury.

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(3) SIBILIA, C. (1924) "Un caso patologico en Myrtus communis" (A pathological case in *Myrtus communis*), *Agric. Colon.*, 18, 10, pp. 352–354, 2 pl.
(4) WISE, F., *The Plant Disease Reporter*, vol. 25, p. 423.
(5) SACCARDO, P. A., *Sylloge Fungorum*, Vol. IV, p. 462.
(6) PAPE, H. (1930): "Die Myrtenschütte" (Leaf Fall of Myrtles), *Die Gartenwelt*, 34, 13, pp. 174–175, 3 figs.
(7) SALGUES, R. (1937): "Deuxième contribution à la flore mycrocryptogamique de l'Ile de Port-Cros" (Second contribution to the microcryptogamic flora of the Isle of Port-Cros)—*Ann. Soc. Hist. Nat. Toulon*, 20 (1936), pp. 130–133.

WISLEY TRIALS, 1952

DIANTHUS

The Council of The Royal Horticultural Society has made the following awards to Dianthus after trial at Wisley, on the recommendation of the Joint Dianthus Committee of The Royal Horticultural Society, the British National Carnation Society and the Alpine Garden Society.

The number in brackets after the description of the variety is that under which it was grown in the trial.

ALLWOODII 'HOPE.' (Raised, introduced and sent by Messrs. Allwood Bros., Ltd., Wivelsfield Nurseries, Haywards Heath, Sussex.) **F.C.C.** July 1, 1952.—Described R.H.S. JOURNAL **76,** p. 416 (**A.M.** 1951). [19]

SHOW ARISTOCRAT. (Raised, introduced and sent by Messrs.

Allwood Bros., Ltd.) **F.C.C.** June 19, 1952.—Described R.H.S. JOURNAL **76,** p. 415 (**A.M.** 1951). [52]

SHOW ENCHANTRESS. (Raised, introduced and sent by Messrs. Allwood Bros., Ltd.) **F.C.C.** July 1, 1952.—Plant vigorous, of good bushy habit, 14 inches tall. Flower stems very strong, upright, 12 inches long. Flower of good form and substance, 2¼ inches diameter, doubie with full centre, petals broad, margins serrated; a shade of salmon Scarlet deeper and brighter than Porcelain Rose (H.C.C. 620), flushed scarlet (H.C.C. 19/1). Free flowering. Calyx strong. (**A.M.** 1950.) [35]

SHOW GRACEFUL. (Raised, introduced and sent by Messrs. Allwood Bros., Ltd.) **F.C.C.** June 19, 1952.—Described R.H.S. JOURNAL **76,** p. 415 (**A.M.** 1951). [28]

WINSOME. (Raised, introduced and sent by Messrs. Lindabruce Nurseries, Freshbrook Road, Lancing, Sussex.) **F.C.C.** June 19, 1952.—Described R.H.S. JOURNAL **76,** p. 416 (**A.M.** 1951). [55]

BRENDA ELLIS. (Raised, introduced and sent by Messrs. A. V. Ellis & Son, 105 Tenter Lane, Warmsworth, Doncaster.) **A.M.** June 19, 1952.—Plant vigorous, compact close growing habit; flower stems rigid, 10–12 inches long. Flowers semi-double, 2 inches diameter, freely produced; a shade of Phlox Pink (between H.C.C. 625/1 and 625/2) zoned Chrysanthemum Crimson (H.C.C. 824/1). Calyx strong. [50]

CASSER'S PINK (sent by Mr. R. S. Oatley, Bridge Nursery, Beddington Gardens, Wallington, Surrey.) **A.M.** June 19, 1952.—Plant very vigorous, bushy erect habit; flower stems very rigid, 14 inches long. Flowers semi-double, 1½ inch diameter, flat, very freely produced, petals fringed and cut; a bright rich dark red near Tyrian Purple (H.C.C. 727). Calyx strong. [65]

LEADER. (Raised, introduced and sent by Messrs. Lindabruce Nurseries.) **A.M.** June 19, 1952.—Described R.H.S. JOURNAL **76,** p. 416 (**H.C.** 1951). [42]

SHOW DISCOVERY. (Raised, introduced and sent by Messrs. Allwood Bros., Ltd.) **A.M.** July 1, 1952.—Plant vigorous, rather spreading habit; flower stems rigid, 13–15 inches long. Flowers double, good form, 2½ inches diameter, very free flowering; Tyrian Rose (between H.C.C. 24/1 and 24/2) zoned a velvety shade of Cardinal Red (H.C.C. 822). Calyx strong. [56]

SHOW PORTRAIT. (Raised, introduced and sent by Messrs. Allwood Bros., Ltd.) **A.M.** July 1, 1952.—Plant vigorous, bushy erect habit; flower stems rigid, 14 inches long. Flowers double, 2½ inches diameter, very good form, clove scented, freely produced; petals broad, finely serrated at edges, a rich velvety shade of red near Cardinal Red (H.C.C. 822). Calyx strong. [66]

ALLWOODII ALPINUS 'MERCURY.' (Raised, introduced and sent by Messrs. Allwood Bros., Ltd.) **H.C.** June 19, 1952.—Plant vigorous, bushy habit; flower stems slender, 6½ inches long. Flowers semi-double, 1½ inch diameter, of good form, freely produced; petals broad, fringed and cut, near China Rose (H.C.C. 024) with small zoning of Cardinal Red (H.C.C. 822) at base of petal. Calyx strong. [5]

ALLWOODII ALPINUS 'WINK.' (Raised, introduced and sent by Messrs. Allwood Bros., Ltd.) **H.C.** June 19, 1952.—Plant vigorous, compact dwarf habit; flower stems slender, rigid, 4–5 inches long. Flowers single, 1½ inch diameter, of good form, flat, open, freely produced; petals broad, slightly cut and fringed, ivory white, eye cream with ring of Fuchsia Purple (H.C.C. 28). Calyx strong. (**C.** 1950.) [1]

ALLWOODII 'EDWARD.' (Raised, introduced and sent by Messrs. Allwood Bros., Ltd.) **H.C.** June 19, 1952.—Described R.H.S. JOURNAL **76,** p. 417. (**C.** 1951.) [74]

BRIDESMAID. (Raised, introduced and sent by Messrs. Allwood

Bros., Ltd.) **H.C.** July 1, 1952.—Plant vigorous, bushy habit; flower stems stout, rigid, 14 inches long. Flowers double, 2½ inches diameter, of very good form, flat, open, freely produced; petals very broad, slightly serrated, a flesh pink near French Rose (H.C.C. 520/2) with a small zone near the centre of Carmine (H.C.C. 21/1). Calyx strong. [27]

COTTAGE LOVELINESS. (Raised, introduced and sent by Mr. R. E. Gardiner, Iles Close, Far Oakridge, Stroud, Glos.) **H.C.** June 19, 1952.—Plant vigorous, upright and compact habit; flower stems slender, rigid, 14–16 inches long. Flowers single, 1½ inches diameter, of good form, open, freely produced; petals broad, much fringed, near Roseine Purple (H.C.C. 629/2). Calyx strong. [45]

SHOW IDEAL. (Raised, introduced and sent by Messrs. Allwood Bros., Ltd.) **H.C.** July 1, 1952.—Plant vigorous, good bushy habit; flower stems slender and rigid, 12–14 inches long. Flowers double, 2 inches diameter, freely produced; petals broad, reflexed, slightly serrated, creamy white flushed French Rose (H.C.C. 520/1) with pencilled ring round eye of Carmine (H.C.C. 21/1). [26]

SHOW PEERLESS. (Raised, introduced and sent by Messrs. Allwood Bros., Ltd.) **H.C.** June 19, 1952.—Plant vigorous, bushy habit; flower stems medium thickness, 12 inches long. Flowers double, 2 inches diameter, freely produced; petals broad, fringed, white with zoning of Rose Opal (H.C.C. 022/2) at base of petals. Calyx strong. [43]

ALLWOODII 'DEREK.' (Raised, introduced and sent by Messrs. Allwood Bros., Ltd.) **C.** June 19, 1952.—Plant vigorous, compact and bushy habit; flower stems stout, 10–11 inches long. Flowers 2 inches diameter, double, freely produced; petals broad, finely serrated, Chrysanthemum Crimson (H.C.C. 824/2) flushed Rose Red (H.C.C. 724). Calyx strong. [73]

PLANTS TO WHICH AWARDS HAVE BEEN MADE IN 1952

Camellia × Williamsii var. 'Donation' F.C.C. April 22, 1952. This outstanding variety received the Award of Merit when shown by the raiser, the late Col. Stephenson Clarke, on March 25, 1941. It forms a well-shaped bush with very glossy, ovate-lanceolate serrulate leaves 3½ inches long. The double flower when fully expanded is nearly 5 inches across and is made up of waved obovate petals of Tyrian Rose (H.C.C. 24/3). Exhibited by Col. R. S. Clarke, M.P., Borde Hill, Haywards Heath, Sussex.

Campanula atlantis A.M. June 17, 1952. This plant is made up of a central stock from which radiate numerous stiff, procumbent stems. The sessile leaves are elliptic, slightly crenate and pubescent. The flowers appear on short, irregularly branched stems, are ⅞ inch long × 1 inch wide, a narrow-campanulate shape and are clasped by leafy sepals. On this interesting Bell Flower each flower is coloured Heliotrope (H.C.C. 636/1) and by a succession of blooms will remain a prominent feature of an alpine house for up to a period of six months. Exhibited by Messrs. W. E. Th. Ingwersen, Ltd., Birch Farm Hardy Plant Nursery, Gravetye, East Grinstead, Sussex, E. W. Sandford, Esq., 99 Leander Road, Thornton Heath, Surrey, and Mrs. C. B. Saunders, Husseys, Green Street Green, Farnborough, Kent.

Campanula lactiflora 'Loddon Anna' A.M. June 24, 1952, as a hardy plant for the herbaceous border. A very attractive, strong-growing variety of this handsome herbaceous perennial. The open, bell-shaped, Amethyst Violet (H.C.C. 35/3) flowers measure up to 1½ inch across and are borne in large loose panicles on branching stems. Raised and introduced by Mr. Thomas Carlile and shown by Messrs. Thomas Carlile (Loddon Gardens) Ltd., Carlile's Corner, Twyford, Berkshire.

Campanula petrophila A.M. June 17, 1952. A fine floriferous specimen was shown with numerous, large, solitary flowers on thin red-tinged stems. Each flower was a broad-campanulate shape, coloured Veronica Violet (H.C.C. 639/1) and had a dark violet rim around the ovary. The corolla was ¾ inch × 1 inch wide with lobes ⅜ × ⅜ inch wide and distinctly ciliate. The calyx was flat, leafy and pubescent. Exhibited by S. E. Lilley, Esq., Crowholt, 133 Monmouth Drive, Sutton Coldfield.

Cyclamen repandum album A.M. April 22, 1952. A white form which is recorded as being discovered in a batch of seedlings, in 1836, by G. I. Kok in Holland, although it may have been known earlier. The shiny dark-green leaves banded with light-green markings, are cordately shaped and have toothed edges. The petals are oblong, twisted and are white with a very light tinge of crimson faintly staining the frilled margins. Exhibited by Victor A. Cohen, Esq., 42b Belsize Park Gardens, Hampstead.

Delphinium 'Anona' A.M. June 24, 1952, as a variety for exhibition. Flower spikes 3 feet long, well proportioned with compact and well spaced flat flowers. Flowers 3½ inches diameter, inner and outer petals near Butterfly Blue (H.C.C. 645/1) with flowers at top of the spike slightly flushed pink. Eye conspicuous, white, covered with pale yellow hairs. Raised and shown by Messrs. Blackmore & Langdon, Twerton Hill Nursery, Bath.

Delphinium 'Guy Langdon' A.M. June 24, 1952, as a variety for exhibition. Flower spikes 2 to 2½ feet long, well proportioned, pyramidal, with evenly spaced flowers. Flowers 3 inches diameter, inner petals Spectrum Violet (H.C.C. 735) at edges with veining of Methyl Violet (H.C.C. 39) and base of petal Methyl Violet (H.C.C. 39); outer petals Methyl Violet (H.C.C. 39). Eye conspicuous, white and purple. Raised and shown by Messrs. Blackmore & Langdon, Twerton Hill Nursery, Bath.

Dianthus Allwoodii 'Vera' A.M. June 10, 1952, as a variety for exhibition. Flower stems upright and strong, calyx strong. Flowers single, 2½ inches diameter, petals flat, broad with serrated edges, Carmine Rose (H.C.C. 621/2) zoned with colour near Blood Red (H.C.C. 820/2). Raised and shown by Messrs. Allwood Bros., Ltd., Wivelsfield Nurseries, Haywards Heath, Sussex.

Dianthus (Show Pink) 'Exquisite' A.M. May 20, 1952, as a variety for exhibition. Flower stems rigid, calyx strong. Flowers double, of good form, 2½ to 3 inches diameter, near Carmine Rose (H.C.C. 621/3) deepening at base of petal to Carmine Rose (H.C.C. 621/2). Raised and shown by Messrs. Allwood Bros., Ltd.

Dianthus (Imperial Pink) 'Lancing Jester' A.M. June 10,

1952, as a variety for exhibition. Flower stem strong and upright, calyx strong. Flowers double, 2 inches diameter, petals broad and evenly arranged, edges finely serrated, white ground with fancy markings of Fuchsine Pink (H.C.C. 627/1). Raised and shown by Messrs. Lindabruce Nurseries, Ltd., Lancing, Sussex.

Dianthus (Imperial Pink) 'Lancing Supreme' A.M. May 20, 1952, as a variety for exhibition. Flower stems rigid, calyx strong. Flowers double, of good form, 2½ inches diameter, flat; petals broad and evenly arranged, margins of inner petals slightly serrated; colour near Carmine Rose (H.C.C. 621/3) zoned and lightly laced Carmine (H.C.C. 21/1). Raised and shown by Messrs. Lindabruce Nurseries, Ltd., Lancing, Sussex.

Eriogonum ovalifolium A.M. May 20, 1952. A large pan was shown, filled with a 2-inch mat of spathulate silvery foliage. From this arose 4-inch–6-inch stems having globular heads of upwards of two dozen greenish-cream flowers. Many of these stems radiated near ground level and thus enlarged the spread of the plant. It is a native of British Columbia and California. Exhibited by Capt. G. K. Mooney, Southmead, Weald, Sevenoaks.

Euryops Evansii A.M. May 20, 1952. A neat shrubby plant about 8 inches high with grey linear leaves 1 inch long and $\frac{3}{16}$ inch wide, that show a parallel venation on the upper side only. The Canary Yellow flowers (H.C.C. 2) are 1 inch across and have about eighteen ray florets. It has proved quite hardy in Worcestershire. Exhibited by R. Bruce Purves, Esq., Chadbury Mill House, Evesham, Worcs.

Hydrangea integerrima A.M. June 24, 1952. An evergreen self-clinging climber native to Chile. It has glossy green, leathery, entire leaves up to 6 inches long and 2 or 3 inches wide. The small creamy-white fertile flowers are borne in dense columnar panicles 4 or 5 inches long. Exhibited by Capt. Collingwood Ingram, The Grange, Benenden, Kent.

Kalmia latifolia 'Clementine Churchill' A.M. June 10, 1952. For over forty years the breeding and selection of seedlings of *Kalmia latifolia* from stocks originally obtained from the Knap Hill Nursery and the Arnold Arboretum have been systematically carried on at Sheffield Park. Many of these seedlings are of much better colour than the forms usually seen, and the one named 'Clementine Churchill' has flowers ¾-inch across coloured Tyrian Rose (H.C.C. 24/2) outside and Rose Madder (23/1–2) inside. Exhibited by Capt. A. Granville Soames, O.B.E., Sheffield Park, Uckfield, Sussex.

Lilium 'Bellingham Hybrid' var. 'Shuksan' F.C.C. July 8, 1952. The stems of this handsome hybrid Lily are tall and stout, and carry evenly spaced whorls of about sixteen lanceolate leaves each about 7 inches long. It has a shapely inflorescence of up to twenty flowers poised on 8-inch horizontal pedicels. The Cadmium Yellow (H.C.C. 8–8/1), maroon-spotted perianth-segments, reflexing strongly, give the flower an almost globular form. Exhibited by the Commissioners of Crown Lands, The Great Park, Windsor, Berks. (Fig. 152).

Lilium 'Sir Lancelot' A.M. July 8, 1952. A lovely hybrid raised from a cross between *L.* × 'Shuksan' and *L. Parryi*. It is a tall and

graceful plant with a head of about seven widely spaced pendulous flowers on spreading pedicels about 7 inches long. The slightly reflexing, Indian Yellow (H.C.C. 6) petals, sparingly spotted with blackish-purple and stained olive green at the base, are 4½ inches long and 1 inch wide. Exhibited by O. E. P. Wyatt, Esq., Maidwell Hall, Northampton.

Mertensia virginica, blue form A.M. April 22, 1952. The Virginian Cowslip is a most attractive early-flowering herbaceous plant, suitable for a moist sheltered border or for open spaces in woodland. Its stems reach a height of between one 1 to 2 feet and bear smooth, lanceolate-ovate leaves of a light green harmonizing perfectly with the French Blue (H.C.C. 43/2) of the tubular clustered flowers. Exhibited by the Commissioners of Crown Lands, The Great Park, Windsor.

Paeonia suffruticosa 'Mrs. George Warre' A.M. May 20, 1952. This is a seedling raised by the exhibitor from the variety 'Silver Pink.' It has a flower 7 inches in diameter composed of fifteen waved and slightly emarginate petals of Rose Madder (H.C.C. 23/2) faintly blotched with deeper colour at the base. Exhibited by Col. F. C. Stern, O.B.E., M.C., F.L.S., V.M.H., Highdown, Goring-by-Sea, Sussex (Fig. 151.)

Paeonia suffruticosa 'Tuso-no-Tsukas' A.M. May 20, 1952. This handsome Japanese Tree Paeony has fully double white scented flowers 8 inches across, made up of narrow pleated and frilled petals. Exhibited by Messrs. Old Court Nurseries, Ltd., Colwall, nr. Malvern.

Pentapera sicula libanotica A.M. May 20, 1952. A fine plant was shown of this paler and more upright form of *Pentapera sicula* (**A.M.** 1951). The corollas, pedicels and bracts were all of a pale creamy yellow, and the dark anthers could be seen at the constricted mouths of the pendent bells. The leaves were about ¼ inch long, and Heath-like, while the whole plant was some 15 inches high. This magnificent specimen also received a Certificate of Cultural Commendation. Exhibited by Mrs. D. E. Saunders, Husseys, Green Street Green, Farnborough, Kent.

Primula Reidii A.M. May 20, 1952. This pure white member of the section Soldanelloideae grows on wet rocks near glaciers in the N.W. Himalaya at 12,000–14,000 feet. It was discovered by Duthie in 1883 and introduced by him in 1887. Its 2-inch woolly leaves have hairs on both surfaces and the corolla is ½ inch long and ½ inch across the expanded mouth, while the flowers are clustered closely into a head. Exhibited by Messrs. Edrom Nurseries, Coldingham, Berwickshire, Scotland.

Rose 'Orange Delight' A.M. May 20, 1952. As a variety for forcing. A sport from 'Queen Juliana' with medium-sized, very brilliant glowing coppery orange flowers of good form and substance which are particularly attractive while opening. Shown by Messrs. A. Noordam N.V., Aalsmeer, Holland.

Rose 'Red Favourite' A.M. July 22, 1952. A large-flowered, semi-double, bright Oxblood Red (H.C.C. 00823) hybrid Polyantha variety raised in Germany by M. Tantau. It is reputed to be mildew proof and the flowers do not blue. Introduced and shown by Messrs. Wheatcroft Bros., Ltd., Ruddington, Nottingham.

Sempervivum ciliosum var. Borisii A.M. May 20, 1952. This

Bulgarian Houseleek has mature rosettes of about 1½ inch across, and the close rosettes of conspicuously ciliated leaves are hairy all over, as are the leaves and stems of the flower scape, the leaves on which have a brown colour on the outer side at the tips. The large pan shown had twenty-two heads of flowers which were pleasing and of a colour approaching pale Chartreuse Green (H.C.C. 663/3), and were about 1¼ inch across. Exhibited by R. E. Heath, Esq., Byland, 95 Hawes Lane, West Wickham, Kent.

Sorbus Aria var. lutescens A.M. May 20, 1952. A variety of the White Beam-tree of which the leaves, opening pale yellowish-green, retain their colour well on into the summer. While young the leaves are covered on both surfaces with a dense cottony tomentum, later becoming glabrous on the upper side. Exhibited by Messrs. T. Hilling & Co., Chobham, Woking.

Veronica (Hebe) macrantha A.M. June 10, 1952. A small evergreen shrub from New Zealand, making a rather compact bush up to 2 feet tall clothed with leathery obovate leaves up to 1 inch long. The four-petalled white flowers, each nearly 1 inch across, are carried in four to eight-flowered racemes springing from the tips of the young growths. Exhibited by A. T. Johnson, Esq., Bulkeley Mill, Tyn-y-Groes, Conway, N. Wales.

Viburnum alnifolium A.M. April 22, 1952. A very striking deciduous species native to North America. The flat, five-rayed inflorescences, carried at the tips of smooth, brownish-grey branchlets, are 4 inches across and consist of a central mass of creamy-white fertile flowers surrounded by about a dozen white sterile flowers each 1½ inch across. The leaves, developed after flowering, are broad-ovate or suborbicular, up to 8 inches long, and turn deep claret-red in autumn. Exhibited by the Commissioners of Crown Lands, The Great Park, Windsor.

Black Currant Amos Black A.M. July 22, 1952. Raised by Mr. H. M. Tydeman at East Malling Research Station. Parentage 'Goliath' × 'Baldwin.' Bush medium, moderately vigorous, sparsely branched. Trusses usually borne singly, occasionally in two's, medium in length with nine to ten berries. Berry large, sub-acid, skin little tough. Hangs very well. This late variety should extend the season, as it ripens a week to ten days after 'Baldwin' and is a regular cropper.

BOOK NOTES

Everyman's "Encyclopedia of Gardening." By Stanley B. Whitehead. 786 pp. Illus. (J. M. Dent and Sons, Ltd.) 20s.

The original volume which first appeared in 1911 was a practical book written by Walter P. Wright for the gardener. The present work has been so revised both in its content and format that it is really a new book. The important thing is that it retains its original purpose and is even more useful to-day to the average gardener because of the inclusion of the latest scientific information on the control of pests and diseases, soil chemistry, cultural methods, new trends in horticulture including emphasis on Heaths, flowering shrubs, market garden practice, etc.

The line drawings are adequate to illustrate the necessary points. At the end of the book two practical features have been added. The first is an illustrated calendar of practical garden work and the second is an outline of garden science, dealing with

the simple but fundamental aspects of the physiology of plants, the processes of growth, reproduction, etc. This book has been produced in the spirit of the times with emphasis on practicality and with the minimum of trimmings.

LANNING ROPER

"Soil and Civilization." By Edward Hyams. 312 pp. Illus. (Thames & Hudson.) 21*s*.

This fascinating account of the nature of the soil in various countries and at various periods of their development is one of a series of publications appearing with the title of 'The Past in the Present' under the editorship of Jacquetta Hawkes.

It is of considerable interest that Mr. Hyams traces the use and misuse of soil by mankind throughout the ages from prehistoric times. In dealing with the relationship of man to the soil the author shows how by a lack of attention in maintaining the fertility of the soil man may pass from membership of the soil to soil parasitism. In the early stages of civilization and in countries with a sparse population too much nutriment is not taken out of the soil. In some cases it may be replaced by nature. The great river valley of the Nile with its yearly floods bringing down silt from the Blue Nile was cultivated for thousands of years without showing any loss of fertility. The Euphrates and Tigris too brought down formerly from the hills sufficient mineral matter to maintain the fertility of the soil of Mesopotamia. But now the deforestation of the Armenian hills has caused the rainfall to be insufficient for maintaining the nutritive power of the soil. The author has evidently a thorough and extensive knowledge of the ancient Greek civilization and he tells us that the soil of Attica at the height of civilization in Athens was poor, partly due to the earlier cutting of timber for shipbuilding. The only trees suitable for the partially eroded soil were the Fig, the Olive and the Vine, which were extensively planted and prevented further erosion.

Coming to recent times Mr. Hyams retells the disaster which visited the Middle West of the United States, where the loose top soil of large areas, where intensive monoculture had been practised, were swept away in great clouds by strong gales, leaving the land as barren as the Sahara. China has often been held up as a country where the native population devoted itself to the enrichment of the soil and kept it in good heart for thousands of years. But Mr. Hyams points out that the friable yellow soil is showing signs of wearing away and, unless the Chinese people take up mixed farming and encourage the establishment of large grass-covered areas, disaster will probably result.

Compared with the errors committed in the agricultural districts of the United States the inhabitants of certain portions of Central America particularly the Aztecs of Mexico and the Incas by their methods of irrigation and the use of guano and also by their religious observances built up the fertility of the natural soil and converted natural soil communities into rich and stable artificial ones.

Luckily, as the author points out, the populations of Atlantic Europe have laboured long and successfully to obtain a rich artificial soil, which may be termed perfect. No doubt the area under consideration has happily an abundant rainfall and is not liable to great heat or drought. But there is also as the author points out, considerable thought devoted to mixed farming in place of dangerous monoculture. There is also a growing appreciation of the composting of animal and vegetable refuse, a certain method of enriching the soil. Containing plenty of humus and the associated organisms it resembles a natural soil community.

F. E. WEISS

"Chrysanthemums for All." By F. W. Allerton. 100 pp. Illus. (Faber & Faber.) 5*s*. 6*d*.

One might almost say that the previous book by this author, *Chrysanthemums for Amateur and Market Grower*, is looked upon as a standard work on Chrysanthemum growing. This new book, *Chrysanthemums for All*, is perhaps a better book for the beginner who hopes to grow good Chrysanthemums for his own pleasure. It gives him all the detail which he really requires both in regard to cultivation, from the taking of cuttings to the cutting of the flowers, and gives some very good advice on pests and diseases.

Chrysanthemums for All can be recommended to all amateur Chrysanthemum growers and particularly to those who hope to become good Chrysanthemum growers.

JOHN B. STEVENSON

"Hardy Chrysanthemum Cultivation." By N. Gerard Smith. 135 pp. Illus. (Faber & Faber.) 12*s*. 6*d*.

The author may be an authority on Organic Surface Cultivation and this book may be a valuable contribution to the literature on this subject. He is obviously not a Chrysanthemum specialist and as a Chrysanthemum book this is of very little value.

Mr. Smith rather assumes the majority of gardeners who do not use his methods do nothing to their soil but dig and incorporate chemical fertilisers. I would say that the majority of our gardeners and all our good gardeners practise a method which perhaps takes advantage of the best of both methods. I always think that the good old-fashioned gardener's method is very similar to organic surface cultivation but carried to a depth of 2 feet instead of a few inches on the surface.

The author criticises the terminology used by the present-day Chrysanthemum grower—a terminology which he obviously does not understand though he goes on using it throughout his book. He gives a short list of the terms and in his description of what they mean gets himself and the reader even more muddled than when he started.

One should not criticise a method of cultivation without seeing the results, for there are many methods which give satisfactory results, and we each tend to think that our own method is best. If some of the illustrations in *Hardy Chrysanthemum Cultivation* show the best results by the O.S.C. method, then it is quite obvious that the method does not produce results which most keen growers look forward to achieving.

JOHN B. STEVENSON

"Alkali Soils, Their Formation, Properties and Reclamation." By W. P. Kelley. 8vo. vi + 170 pp.; with 14 figs. (Reinhold Publishing Corporation, New York.) 1951. Price 40*s*.

Scattered over the arid regions which comprise a third of the earth's surface are found numerous patches of alkaline soils varying in size and in the burden of salts they carry. The accumulation of salts in the soils presents problems both to those interested in a study of the soil itself and to those whose major interest is in the crops such soils may grow. The author has, for a number of years, studied such soils in W. America and in California especially.

In his earlier chapters he traces out the origin of saline conditions in soils; the text is later concerned with considerations of the relationship between salinity and the practice of irrigation. In the closing chapters the reclamation of alkaline soils is described; and here the illustrations show clearly under certain conditions the value of additional sulphur or of alum or other substances including ferrous sulphate, in making the growth of satisfactory crops possible on soils otherwise almost barren of vegetation.

To appreciate the succinct arguments and brief discussion of the data presented, the reader should have some knowledge of elementary chemistry and should be familiar with chemical concepts as, for example, that of exchangeable soil bases; if he is also familiar with the modern terms used in soil classification to designate soil types his task will be slightly easier.

But from the horticultural point of view, in our own country, alkaline soils, with high intensity of soil alkalinity (over *p*H 8·7), rarely occur; relatively few plants that tolerate alkalinity are grown in gardens in contrast to the many that prefer acidic soils.

A valuable feature of the book is the selected bibliography.

M. A. H. TINCKER.

"Flowering Shrubs and Trees for South African Gardens." By Sima Eliovson. 148 pp. Illus. (Howard Timmins 58/60 Long Street, Cape Town. George Philip & Son Ltd., London.) 63*s*.

This is a charming book and as far as I know the best work on the subject published in South Africa. It should be very popular since it is written for the amateur but nevertheless contains so much and such useful information that every keen gardener will want to possess a copy. It is a great pity that the price is high (63*s*.) and will put it beyond the means of many. On the whole it is very well executed, and it is lavishly illustrated with 28 full size black-and-white, and 48 quarto-size coloured photographs. The reproduction of the photographs, which have been chosen with care, is of varying quality. In some the overprinting of colours is not accurate, resulting in a blurred effect obscuring the detail of the flowers; in others the colours are exaggerated or do not do justice to the subject. Most of them are, however, quite pleasing.

The volume contains 146 pages and is divided into eight chapters. The first five deal with the effect of climate and soils on trees and shrubs, propagation, planting, general care and planning of the garden. A concise indication of the climatic preferences, flower colour, and garden merit is given in the next two chapters, and is presented in the form of a number of lists under headings such as "Shrubs for Shady Places," "Shrubs for Dry Conditions" and many others. These two chapters together with the next and last, which contains descriptions of most of the plants mentioned, give just the information gardeners want and which is often difficult to find.

Common names are used throughout but are followed by latin names in brackets

and italics. The value and necessity of latin names is stressed and care has been taken to bring these up to date.

It is gratifying to note that a fair percentage of indigenous shrubs are included. Especially the inclusion of Heaths and Proteas is welcome, since the possibilities of these plants in "Highveld" areas outside the Cape have only fairly recently been realized.

This book has been written with enthusiasm which eventually affects the reader and for this and the other merits of the book the author can be heartily congratulated.

"Nuttall's Travels into the Old Northwest. An unpublished 1810 Diary." By Jeannette E. Graustein. vii + 88 pp. 11 plates. (Chronica Botanica xiv. nos. 1–2.) (Chronica Botanica Co., Waltham, Mass. William Dawson & Sons Ltd., London.) 1951. $3.00.

Thomas Nuttall first visited the United States in 1808 where he travelled extensively, becoming an outstanding collector of new species of North American plants. This diary, to which the author has added a short biography of Nuttall, describes one of the journeys undertaken by him for Benjamin Smith Barton, Professor of Materia Medica, Natural History and Botany at the University of Pennsylvania. Nuttall began his journey from Philadelphia in April 1810 travelling to Pittsburg by stage-coach, proceeding thence on foot to Franklin, Waterford (Le Boeuf) and along the southern shore of Lake Erie to the Huron River. He then took a boat to Detroit. His observations of the Detroit area where he stayed from June 26 to July 29 occupy fifteen pages of the diary. The notes in the diary are sporadic from this point onwards. The next dated entries indicate that on September 9 he travelled up the Fox River and reached the portage to the Wisconsin on the 10th, eventually arriving at St. Louis where he proceeded to explore the Upper Missouri River. In the course of his journeyings he made valuable observations on the flora, fauna and geology.

The diary ends with a "Cash Account" and three appendices. Appendix I gives Barton's directions and the Terms of Agreement dated April 7, 1810, between him and Nuttall. The animals noted by Nuttall are listed in Appendix II, the plants in Appendix III. The work is well printed and produced and contains a facsimile page from the original diary, two maps, a portrait and other illustrations. It will be read with interest by botanists and horticulturists. Nuttall was the author of *The Genera of North American Plants*, published in 1818, and *An Introduction to Systematic and Physiological Botany* which appeared in 1827.

H. S. MARSHALL

"Handbooks for the Identification of British Insects." Vol. VI, Part 2 (a). "Hymenoptera. 2 Symphyta. Section (a)." By R. B. Benson. 49 pp. Illus (Royal Entomological Society of London.) 10s.

The large Order Hymenoptera will eventually occupy three of the proposed ten volumes required to complete the series. The present work is the first part of the Hymenoptera to be published, and, in dealing with a section of the Symphyta, no better authority than Dr. Benson of the British Museum could have been chosen.

The Symphyta includes all the Sawflies and Woodwasps, and the well-illustrated text is in the form of a key, enabling the reader to identify an insect down to species level. Each species is fully described in accordance with present knowledge, and, in addition, its known distribution and plant host relationship is mentioned.

This handbook is of no use to the horticulturist unless he has a sound fundamental knowledge of Entomology, but for the Entomologist and Student of Entomology it will form an invaluable addition to his reference literature.

V. W. FOWLER.

"Manual of Bacterial Plant Pathogens." By Charlotte Elliott. 2nd ed., 1951. 186 pp. (Chronica Botanica Co., Waltham, Mass., U.S.A.) 48s.

The long awaited second edition of Elliott's *Manual* will be welcomed by all plant pathologists interested in bacterial diseases of plants not only for the wealth of information so concisely presented but also for the references and indexes of host plants and pathogens.

The nomenclature follows that of the latest (1948) edition of Bergey; but the price is rather excessive for sterling countries and might have been reduced by the omission of the section on Bacillus, Micrococcus, etc., and also of the reproductions of Erwin Smith's drawings.

Owing to the long delay in publishing, no literature later than 1948 is included, which detracts somewhat from an otherwise indispensable work.

W. J. DOWSON

"Growing Woodland Plants." By Clarence and Eleanor Birdseye. 223 pp. Illus. (Geoffrey Cumberlege, Oxford University Press, London.) 24*s*.

This little book sets out to be a guide to the cultivation of American plants in woodland conditions. Since woodland gardening in our view offers an escape from the tedium and technicalities of ordinary cultivation, the reader of these pages who holds that view will conclude that they have little to offer him. For the authors elaborate at length on every detail of culture, including propagation, composting and the control of soil acidity by artificial means. Now this, especially in dealing with native plants, appears to be a contravention of the generally accepted assumption that the main essential in woodland gardening consists of so selecting your plants that they will prosper practically unaided under the conditions you have to offer them, rather than indulge in efforts to render those conditions suitable to the plants. However, though the range of subjects is limited, and for the most part confined to the lesser wild flowers, the description of about 200 species, profusely illustrated by line drawings, will be found interesting and helpful. The very scanty reference to shrubs —entire genera, such as Vaccinium being unmentioned—is regrettable, and of such important groups as Erythronium and Lilium, only one, or at most two, species are given. Other important omissions include such typical American woodlanders as *Galax aphylla* and *Shortia galacifolia*. The most comprehensive sections are the Orchidaceae and Ferns. The book is written in an easy, engaging style, there is a good index and a tabular list of scientific and English names.

A. T. JOHNSON

"Principles of Plant Physiology." By James Bonner and Arthur W. Galston. 8vo. xvi + 483 pp. 209 illus. (W. H. Freeman & Co., San Francisco, 1952.) 47*s*.

Twenty-five or thirty years ago the number of text-books written in English which were available to students of plant physiology was quite small; the rapid development of so many branches of this science, both in its pure and applied aspects, has been accompanied by a veritable spate of publications, of research reports, monographs and text-books, of which many are of American origin. Nowadays greater opportunity presents itself for plant physiologists to pursue their studies professionally and the authors of this book estimate that there must be at least 2,500 plant physiologists so employed in the U.S.A.

In making their selection of the facts to be put before the reader it is stated that the authors have discarded certain less important details in favour of those facts and concepts which are central to the understanding of the functioning plant. Their selection has been well made; it is largely, but by no means entirely, based on American investigations. Their presentation of the information in layout and design shows a tendency towards "streamlining," in that obtruding facets that might impede sweet progress have been smoothed away. "Detailed discussions of contradictory views have been avoided," they state, and sometimes neatly avoided. Thus a clear account of the general principles is offered to the reader, well illustrated by numerous graphs, diagrams and drawings of which the majority should prove helpful.

The main divisions of the text are made into the categories of nutrition, metabolism, and growth and development. For appreciation of the argument a student should have some biochemical knowledge, but with that proviso, the book can prove very useful to advanced horticultural students and others seeking up-to-date information.

M. A. H. TINCKER

"Weed Seedlings." By Anna P. Kummer. 435 pp. Illus. (The University of Chicago Press and Cambridge University Press, London). 37*s*. 6*d*.

This is an extraordinarily useful book for rapid identification of weed seedlings of 300 species of plants considered in the weed category in Canada and the United States. This of course leads to the definition of a weed, and I always recall C. P. Raffill's comment that a weed is a good plant in the wrong place. In this book the author has used weeds to mean plants—common, particularly dangerous, or noxious. There is a useful artificial key and excellent reproductions of life-size line drawings by the author showing seedlings in three stages of development with drawings twice the natural size of the seed leaf, and the first, third and fifth leaves. The text is descriptive and good in its brevity and accuracy of description.

LANNING ROPER

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Other Exhibits

Aster seedling, from Major-Gen. R. F. B. Naylor, C.B., C.B.E., D.S.O., Barnet.
Begonia, from the Parks Dept., Alexandra Park, Hastings.
Gladioli seedlings and Zinnia, from Mrs. H. W. Hall, Lymington, Hants.
Pelargonium seedling, from R. F. W. Cartwright, Esq., Banbury.
Rose, from Messrs. Jordan's English Rose Tree Co., Sanderstead.
Violas, Roses and Chrysanthemums, from Mr. C. A. Jardine, Feltham.

FLORAL COMMITTEE B—Mr. E. A. Bowles, M.A., F.L.S., F.R.S.E., V.M.H., in the Chair, and ten other members present.

Awards Recommended:

Flora Medal

To Messrs. Robinson's Nurseries, Ltd., Eltham, for an exhibit of rock garden plants.
To Mr. Frederick Street, Woking, for an exhibit of Heaths and other flowering shrubs.

Award of Merit

To *Tripterygium Wilfordii*, as a hardy ornamental fruiting shrub (votes unanimous), from Col. F. C. Stern, O.B.E., M.C., F.L.S., V.M.H., Highdown, Goring-by-Sea, Sussex.
To *Viburnum hupehense*, as a hardy ornamental fruiting shrub (votes 8 for, 3 against), from the Director, R.H.S. Gardens, Wisley.

Other Exhibits

Datura suaveolens, exhibited by Mrs. Montgomery, Snells Farm, Amersham Common.
Lilium 'Jillian Wallace,' exhibited by W. Bentley, Esq., Quarry Wood, Newbury.
Sorbus decora var. *nana*, exhibited by the Director, R.H.S. Gardens, Wisley.
Rock Garden Plants, exhibited by Messrs. Simmonds, Chipperfield, Herts.
Succulents, exhibited by Mr. C. Gilbert, Romford.

JOINT CHRYSANTHEMUM COMMITTEE—Mr. E. F. Hawes in the Chair, and eight other members present.

Awards recommended:

First Class Certificate

To 'White Wings,' as a variety for exhibition (votes unanimous), shown by Messrs. J. & T. Johnson, The Nurseries, Tibshelf, Derbyshire.

Award of Merit

To 'Sweet Sixteen,' as a variety for exhibition (votes 6 for, 1 against) and 'Tribute,' as a variety for exhibition (votes 6 for, 0 against), shown by Messrs. J. & T. Johnson, The Nurseries, Tibshelf, Derbyshire.
To 'John Woolman,' as a variety for exhibition (votes unanimous), from Messrs. H. Woolman Ltd., Shirley, Birmingham.

Other Exhibits

Chrysanthemums, from Messrs. J. & T. Johnson, Messrs. H. Woolman, Ltd., Messrs. Greenyer Bros., Ltd., Broadwater Green Nurseries, Worthing, and Messrs. R. & J. Turner, Ltd., Quay Road Nurseries, Bridlington.

JOINT DAHLIA COMMITTEE—Mr. E. Cheal in the Chair, four members, three others being co-opted from Floral Committee A were present.

Selected for Trial at Wisley

Dahlia 'Janet Beckett,' shown by A. C. Wilding, Esq., 142 Strathmore Avenue, Luton.
Dahlia 'Button,' shown by Mr. W. W. Bunney, The Lodge, Barcombe, Sussex.

Other Exhibits

Dahlia Seedling, shown by Mr. W. W. Bunney, The Lodge, Barcombe, Sussex.
Dahlia Seedling, shown by R. L. Wolpers, Esq., 19 Cedar Avenue, Sidcup, Kent.

JOINT ROCK GARDEN PLANT COMMITTEE—Mr. W. Bentley in the Chair, and eight other members present.

Awards Recommended:

Award of Merit

To *Gentiana depressa* (L. & S. 12000) as a hardy flowering plant for the alpine house or the scree garden (votes 7 for, 0 against) from The Director, R.H.S. Gardens, Wisley, Ripley, Surrey.
To *Gentiana* 'Inverleith' as a hardy flowering plant for the rock garden (votes 6 for 0 against) from A. G. Weeks, Esq., The Weald Cottage, Limpsfield Common, Surrey.

Other Exhibits:

Gentiana saxosa (A.M. 1936) and *Trachelium lanceolatum* (which the Committee would like to see again next year) from The Director, R.H.S. Gardens, Wisley, Ripley, Surrey.

SEPTEMBER 9, 1952

SCIENTIFIC COMMITTEE—Mr. E. A. Bowles, M.A., F.L.S., F.R.E.S., V.M.H., in the Chair, and six other members present.

The Hon. L. Palmer showed flowers from two corms of *Cyclamen graecum*. These flowers showed considerable variation in the degree of development of the auricles. Those from one corm were markedly auricled like the flowers of *C. neapolitanum*, whereas those from the second corm were only slightly auricled and consequently had a much more open pentagonal aperture.

Mr. Mackenzie reported that during the past two years his plants of *Titanotrichum Oldhamii* had behaved as sometimes does the plant in the field, in that it had produced on the inflorescence long whip-like appendages bearing clusters of small rudimentary flowers in the axils of small subulate bracts, and similar structures in the axils of some of the leaves. This year, however, no such flagelliform structures had been developed.

Proliferating Scabiosa.—Mr. A. E. Hutton, Horsley House, 25 Chestnut Rise, Plumstead, London, S.E. 18, exhibited specimens of the flowers of *Scabiosa atropurpurea*. Some of these were quite normal but others exhibited marked proliferation of the axis, with tufts of leaves and one or two flowers produced at the apex of the old flower head which was not flat but markedly elongate.

Dahlia Chimaera.—Messrs. E. Cooper & Sons, Jescot Nurseries, 388 Hatfield Road, St. Albans, Herts, submitted specimens of a Dahlia which was a result of a cross made in 1950 between 'Jescot Kenny' and a seedling of 'Jescot Kenny,' the latter being the pollen parent. The stock was propagated by cuttings in 1951 and now plants are showing considerable variation not only in the colour of the flower but also in the colour of the stems. Some stems are light green, others red and others streaked with red and green. There are also eight different colour types of flower. Mr. E. Cooper informed the Committee that his stock of this Chimaera had been given to the John Innes Horticultural Institute and to the Hertford Agricultural Institute.

Mr. H. K. Marwick, "Stormont," Sole Farm Road, Great Bookham, Surrey, showed a specimen of Sweet Pea 'Ambition' with eight flowers.

Colchicum Sibthorpii.—Mr. Bowles reported on a Colchicum which had been collected at Tatoi, in 1946, by Mr. Ogilvie-Grant. This was the true *C. Sibthorpii* with lightly tessellated flowers markedly tapering at the base, and with horizontally spreading leaves of a somewhat dull bluish-green colour and wavy at the margins. It was quite a different plant from that which was given the Award of Merit in 1901 under the name of *C. Sibthorpii*. This latter plant, from Northern Greece, had more globular flowers, round at the base and of a richer colouring, and leaves more or less erect and scarcely at all wavy. The Award of Merit plant probably represented what is now known as *C. Bowlesianum* (see Burtt in *Kew Bulletin* 1950, 433 (1951).

Plant referred from Floral Committee B.—Specimens of a plant shown by Mr. W. J. Marchant, Keeper's Hill Nursery, Stapehill, Wimborne, Dorset, under the name of *Sorbus cashmiriana* were referred to the Committee for confirmation of name. The Committee agreed that the plant was identical with the plant which is in cultivation under this name and asked the Royal Botanic Gardens, Kew, to check up the validity of the name.

FRUIT AND VEGETABLE COMMITTEE—Mr. F. A. Secrett, C.B.E., F.L.S., in the Chair, and ten other members present.

Awards Recommended:

Silver-gilt Hogg Medal

To Messrs. The Leconfield Estate Co., Petworth Park, Petworth, Sussex, for an exhibit of Grapes, other fruits and Nuts.

Silver Hogg Medal

To Messrs. J. Cheal & Sons, Ltd., Crawley, Sussex, for an exhibit of Apples, Pears, Plums and Nuts.

Silver Lindley Medal

To The John Innes Horticultural Institution, Bayfordbury, Hertford, for an exhibit of new Apple and Pear varieties.

Hogg Medal

To Messrs. Winkfield Manor Nurseries, Ltd., Ascot, for an exhibit of Apples and Pears.

Selected for Observation at the National Fruit Trials, Wisley

Apple 'John Huggett,' from John S. Huggett, Esq., Heatherlands, Netherleigh Drive, Grange-over-Sands, Lancs.

Other Exhibits

Apple Seedling, from E. C. Mountford, Esq., Eastern Lodge, Kempsey, Worcester.
Apple Seedling, from Messrs. The Barnham Nurseries, Ltd., Barnham, Sussex.
Plum 'Pond's Seedling,' from E. J. Dore, Esq., The Cottage, Riseley, nr. Reading.
Plum for naming, from P. Chandler, Esq., 205 Reading Road, Wokingham, Berks.
Peach Seedling, from H. F. S. Bale, Esq., 22 Greenhayes Avenue, Banstead, Surrey.
Grape 'Ontario,' from the Director, National Fruit Trials, Wisley.

FLORAL COMMITTEE A—Mr. G. W. LEAK, V.M.H., in the Chair, and nineteen other members present.

Awards Recommended:

Gold Medal

To Mr. Stuart Ogg, Swanley, for an exhibit of Dahlias.

Silver-gilt Flora Medal

To Messrs. Bees, Ltd., Chester, for an exhibit of herbaceous plants.
To Messrs. Brown & Such, Ltd., Maidenhead, for an exhibit of Dahlias.

Silver-gilt Banksian Medal

To Messrs. Allwood Bros., Ltd., Haywards Heath, for an exhibit of Carnations.
To Mr. John R. Bell, Cross-in-Hand, for an exhibit of Chrysanthemums.
To Messrs. Blackmore & Langdon, Bath, for an exhibit of Begonias, Delphiniums, Chrysanthemums.
To Messrs. Kelway & Son, Ltd., Langport, for an exhibit of Gladioli.
To Messrs. J. F. Spencer & Son, Ltd., Hockley, for an exhibit of Dahlias.
To Messrs. A. G. Vinten, Ltd., Balcombe, for an exhibit of Chrysanthemums.
To Messrs. Wheatcroft Bros., Ltd., Ruddington, for an exhibit of Roses.

Silver Flora Medal

To Messrs. Home Meadows Nursery, Martlesham, for an exhibit of Dahlias.
To Messrs. Keith Luxford, Ltd., Sawbridgeworth, for an exhibit of Chrysanthemums.
To Messrs. S. McGredy & Son, Portadown, for an exhibit of Roses.
To Messrs. Napiers Stepswater Nurseries, Ltd., Taunton, for an exhibit of Chrysanthemums.

Silver Banksian Medal

To Messrs. Bakers' Nurseries, Ltd., Codsall, for an exhibit of Delphiniums and other herbaceous plants.
To Messrs. J. Cheal & Sons, Ltd., Crawley, for an exhibit of Dahlias.
To Messrs. Greenyer Bros., Ltd., Worthing, for an exhibit of Chrysanthemums.
To Messrs. Rose Cottage Nurseries, Enderby, for an exhibit of Dahlias.
To Messrs. W. Wood & Son, Ltd., Taplow, for an exhibit of Chrysanthemums, Dahlias and Asters.
To Messrs. The Yelland Nursery, Teignmouth, for an exhibit of Chrysanthemums.

Flora Medal

To Messrs. Barr & Sons, Taplow, for an exhibit of Nerines and Montbretias.
To Messrs. Thomas Carlile, Ltd., Twyford, for an exhibit of Asters and other herbaceous plants.
To Mr. H. V. Cartwright, Hatch End, for an exhibit of Chrysanthemums.
To Messrs. W. Fromow, Ltd., Chiswick, for an exhibit of *Primula obconica* vars.
To Messrs. Hollamby's Nurseries, Groombridge, for an exhibit of Dahlias.
To Messrs. Monkswood Nursery, Usk, for an exhibit of Dahlias.
To Messrs. Old Court Nurseries, Ltd., Colwall, for an exhibit of Asters.
To Messrs. Wakeley Bros. & Co., Ltd., North Mymms, for an exhibit of Gladioli and Asters.
To Messrs. Winkfield Manor Nurseries, Ascot, for an exhibit of herbaceous plants.

Banksian Medal

To Messrs. Ben R. Cant & Sons, Ltd., Colchester, for an exhibit of Roses.
To Messrs. Arthur Charlton & Son, Ltd., Tunbridge Wells, for an exhibit of Roses.
To Mr. E. B. Le Grice, North Walsham, for an exhibit of Roses.
To Mr. A. Miles, Bickley, for an exhibit of herbaceous plants.
To Mr. Stuart Ogg, Swanley, for an exhibit of Delphiniums, Phloxes, etc.
To Messrs. M. Prichard & Sons, Ltd., Christchurch, for an exhibit of herbaceous plants.
To Mr. E. V. Roe, Reigate, for an exhibit of herbaceous plants.
To Messrs. Simmonds Nurseries, Ltd., Chipperfield, for an exhibit of herbaceous plants
To Mr. G. G. Whitelegg, Knockholt, for an exhibit of herbaceous plants.

Award of Merit

To Rose 'Tzigane' (votes 13 for, 0 against), from Messrs. Wheatcroft Bros., Ltd., Ruddington.

Selected for trial at Wisley

Aster 'Fontaine,' from Messrs. Old Court Nurseries, Ltd., Colwall.

To be seen again

Aster 'Tapestry,' from Messrs. Old Court Nurseries, Ltd., Colwall.

Other Exhibits

Anemones and Gentians from Mr. C. Newberry, Knebworth.
Asters and other herbaceous plants from Messrs. Hale & May, Ltd., Cippenham.
Dahlias from Messrs. Pinetree Fruit Farm, Cranborne.
Herbaceous plants from Messrs. F. Toynbee, Ltd., Barnham.
Pelargonium from R. Barnes, Esq., Wallington.
Roses from Messrs. Sale & Son, Ltd., Wokingham.
Roses from Messrs. E. W. Stedman, Ltd., Longthorpe.
Saintpaulias from Mrs. Bowes-Lyon, Aldwick.
Scabious from Messrs. Isaac House & Son, Bristol.
Violas and Roses from Mr. C. A. Jardine, Feltham.

FLORAL COMMITTEE B—Lord ABERCONWAY, C.B.E., LL.D., D.Sc., V.M.H., in the Chair, and fourteen other members present.

Awards recommended:

Gold Medal

To the Borough of Wembley Parks Department, Wembley, for an exhibit of Codiaeums.
To Messrs. Hillier & Sons, Winchester, for an exhibit of Conifers.

Silver-gilt Banksian Medal

To Messrs. Thos. Rochford & Sons, Ltd., Turnford Hall Nurseries, Herts, for an exhibit of greenhouse foliage and flowering plants.

Silver Banksian Medal

To Messrs. J. Cheal & Sons, Crawley, for an exhibit of berried and flowering shrubs.
To Mr. W. J. Marchant, Wimborne, for an exhibit of berried and flowering shrubs.
To Messrs. L. R. Russell, Ltd., Windlesham, for an exhibit of flowering and foliage shrubs.
To Messrs. J. Waterer, Sons & Crisp, Ltd., Bagshot, for an exhibit of berried and flowering shrubs.

Flora Medal

To Messrs. Arthur Charlton & Sons, Ltd., Tunbridge Wells, for an exhibit of Clematis and other shrubs.
To Messrs. Craigwell Nurseries, Feltham, for an exhibit of greenhouse plants.
To Messrs. Haskins Bros., Bournemouth, for an exhibit of Clematis and other flowering shrubs.
To Messrs. W. E. Th. Ingwersen, Ltd., East Grinstead, for an exhibit of rock garden plants.

Banksian Medal

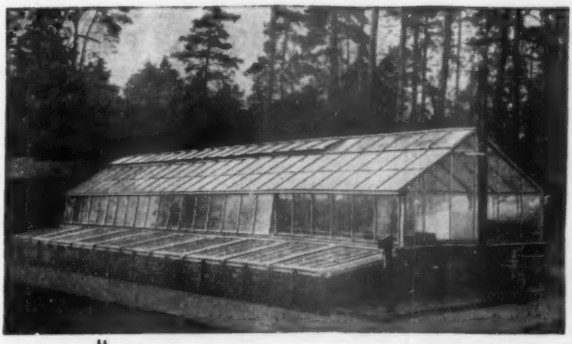
To Messrs. Edrom Nurseries, Coldingham, for an exhibit of rock garden plants.
To Mr. C. Gilbert, Romford, for an exhibit of succulents.
To Mr. K. W. Harle, Lower Basildon, for an exhibit of succulents.
To Messrs. Pennell, Ltd., Lincoln, for an exhibit of Clematis and other shrubs.
To Messrs. Robinson's Nurseries, Ltd., Eltham, for an exhibit of rock garden plants.
To Mr. Frederick Street, Woking, for an exhibit of Heaths and other flowering shrubs.

Award of Merit

To *Sorbus cashmiriana*, as a hardy, ornamental-fruiting tree (votes 13 for, 0 against), (subject to verification of the name), from Mr. W. J. Marchant, Keeper's Hill Nursery, Stapehill, Wimborne.

Other Exhibits

Colchicum Sibthorpii, exhibited by M. Ogilvie-Grant, Esq., 71 Kew Green, Surrey.
Euonymus latifolius, *Sorbus hybrida Gibbsii*, exhibited by Dr. Lane Roberts, Mill House, Tewin, Welwyn.
Hibiscus syriacus var. 'Woodbridge,' exhibited by Messrs. R. C. Notcutt, Ltd., Woodbridge.
Lilium dauricum × *sulphureum*, exhibited by The Director, R.H.S. Gardens, Wisley.
Pyracantha 'Waterer's Orange,' exhibited by Messrs. J. Waterer, Sons & Crisp, Ltd., Bagshot.
Clipped trees, exhibited by Messrs. Kew Topiary Nursery, Ltd., Richmond.
Rock Garden plants, exhibited by Messrs. East Lodge Gardens, Enfield.



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Lady L. Bloes, cerise pink, red eye
Lady Buchanan Jardine, large rich salmon pink
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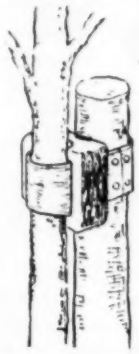

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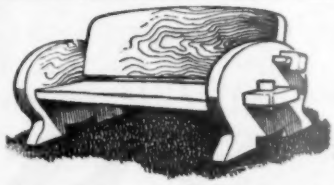

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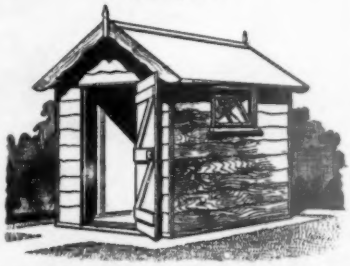

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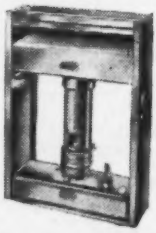

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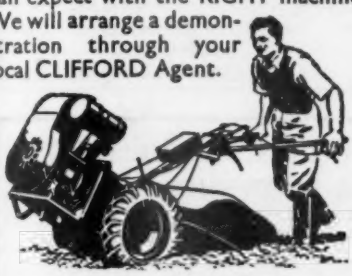

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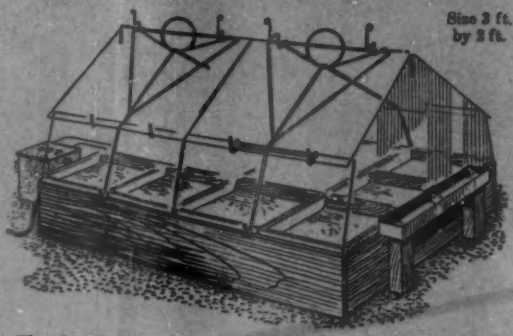

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